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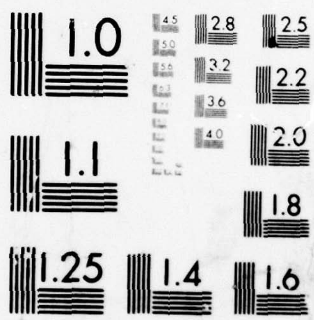

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Report FAA-EE-79-09

LEVEL II

(14)

INM

INTEGRATED NOISE MODEL
VERSION 2

USER'S GUIDE

September 1979

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC 20591

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16. Abstract

This document contains the instructions to execute the Integrated Noise Model (INM), Version 2. The INM is a collection of computer programs which can calculate the aircraft noise environment in the vicinity of an airport given certain information on airport location, layout, and the type and movement of its air traffic.

INM Version 2 supersedes Version 1 which was released in January 1978. This document replaces "FAA Integrated Noise Model, Version 1, Basic User's Guide" (Report No. FAA-EQ-78-01).

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1.0 INTRODUCTION

Version 1 of the Integrated Noise Model (INM) was released in January 1978 by the Federal Aviation Administration (FAA). This model was intended to help airport planners in assessing the noise impact of aircraft or further to calculate and integrate the noise impact of an entire day's operations at an airport. A Basic User's Guide was distributed at that time.

Version 2 of the INM contains enhancements, corrections, and a larger data base of aircraft noise and performance. One major objective for Version 2 is to make the INM easier to use and thus more effective. The ease of use is derived from the addition of the capability for interactive conversional input and double-checking of entries from a computer terminal. Another major objective for Version 2 is to make the INM more flexible. The user can define alternative sets of aircraft noise and performance data and thus simulate the local airport characteristics more closely.

A summary of the changes from Version 1 to Version 2 is as follows:

- o Addition of an interactive, conversational input module.
- o Increase of the number of aircraft types in the data base.

- Input editing.
- The user can enter noise curve data.
- The user can enter takeoff profiles.
- The user can enter approach parameters.
- The user can define new aircraft types.

1.1 BACKGROUND

In the Aviation Noise Abatement Policy, November 18, 1976, the Secretary of Transportation and the Federal Aviation Administrator reiterated the responsibility of the FAA, established by a 1969 mandate from Congress, to reduce aircraft noise. This responsibility extends to promoting compatible land use in areas adjacent to airports and providing technical and financial assistance to airport proprietors undertaking comprehensive noise abatement planning.

The Integrated Noise Model represents the continuing effort of the FAA to provide the technical means to analyze aircraft noise abatement. As Administrator Langhorne Bond said in an interview given in early 1978, "One of the features of our strategy at National Airport is that, for the first time, we proposed the use of the FAA's integrated noise model, which is a very useful tool for airport operators all around the country to adopt."[1] The INM is the one tool which can meet both the cumulative noise measure continuous

1 FAA World, Vol. 8 No. 5, U.S. Department of Transportation, Federal Aviation Administration, Office of Public Affairs, Washington, D.C., May 1978.

contours and the sound level durations and cumulative noise measures for discrete point requirements of Order 1050.1B, "Policies and Procedures for Considering Environmental Impacts," June 16, 1977. The INM is the recommended tool to generate Land Use Guidance Zones (LUG) and data for site analyses for Airport Noise Control and Land Use Compatibility Planning (ANCLUC) studies.[2]

Airport planners, airport operators and local governments are required to address the recurring problems of assessing noise impact. The significance of these problems is underscored by increasing public awareness of urgent environmental and safety concerns and development of technologically feasible and economically reasonable solutions. The INM constitutes the ongoing commitment of the FAA to provide the most sophisticated analytical approach.

1.2 INM CAPABILITIES

The INM contains computer programs for determining the impact of aircraft noise at or around airports. This noise impact can be given in terms of contours of equal noise exposure for any of the following noise measures:

1. Noise Exposure Forecast (NEF)

   Description: NEF was developed in 1967 and is based on effective perceived noise decibel (EPNdB) as

2/ Advisory Circular 150/5050-6, "Airport-Land Use Compatibility Planning," U.S. Department of Transportation, Federal Aviation Administration, December 30, 1977.

the unit of aircraft noise. All aircraft operations during the period 10 p.m. to 7 a.m. are weighted by a factor of 16.7 per one operation.

2. Equivalent Sound Level (Leq)

   Description: Leq is an energy summation of the aggregate noise environment as measured in A-weighted decibel units.

3. Day-Night Average Sound Level (Ldn)

   Description: Ldn was developed in 1973-74 for the Environmental Protection Agency (EPA). Ldn is based upon Leq with the aircraft operations during the period 10 p.m. to 7 a.m. weighted by a 10 decibel penalty.

4. Community Noise Equivalent Level (CNEL)

   Description: CNEL was developed for the State of California. It is similar to Ldn except that an intermediate weighted is added for the early evening hours (7 p.m. to 10 p.m.).

The contours are presented in the forms of printout of the contour coordinates and area impacted and the plots of the contours. The other choice of output is the calculation of several noise measures at specific points (grid) in the airport vicinity. In addition to the four cumulative energy measures of aircraft noise described above, the following measure is also provided:

5. Time of exposure above a specified threshold of A-weighted sound level (TA)

   Description: TA was developed by the FAA in 1975. TA indicates the amount of time that a threshold

sound level in dBA is exceeded during a given time period. Six standard thresholds (65, 75, 85, 95, 105, 115) are offered and the exposure is broken down into three daily periods; 24 hours, evening hours (7 p.m. to 10 p.m.) and night hours (10 p.m. to 7 a.m.) on the grid output.

1.3 INM DATA BASE

For the convenience of the user, a standard data base of aircraft noise and performance is retrieved during each execution of the INM. The data base contains representatives of commercial, general aviation, and military aircraft which are powered by turbojet, turbofan, or propellor-driven engines. Each of these aircraft is associated with a set of departure profiles for each applicable trip length, set of approach parameters, Noise Exposure Level (NEL) vs. distance curves at several thrust settings , Effective Perceived Noise Level (EPNL) vs. distance curves at several thrust settings and set of TA parameters. The user should refer to the Data Base Report on the contents of each of these data sets. Figure 1.4.1 gives the identification number of each aircraft in the data base and the identification number of each data set associated with that aircraft. In many instances, several aircraft would share the same data set or a particular departure profile data set is applicable to a wide range of trip lengths. These conditions are evidenced by the multiple appearances of some of the identification numbers in Figure 1.4.1. Figure 1.4.1 is a reference to use in the later sections which discuss the input options of alternative aircraft definitions, alternative takeoff profiles and alternative

AC	NAME	NC	AP	TAKEOFF PROFILES BY TRIP LENGTH CATEGORY 1	2	3	4	5	6	7
1	2E NBTF DC-9-32	2	2	48	49	49	49	0	0	0
2	DC-9-15	2	2	46	47	47	47	0	0	0
3	BAC-111	2	2	48	49	49	49	0	0	0
4	737-100/200	5	5	43	44	45	45	0	0	0
5	3E NBTF 727-200	8	8	18	20	20	20	0	0	0
6	727-100	8	8	17	18	19	20	0	0	0
7	4E NBTF 707-320B/C	11	11	27	28	29	31	34	36	36
8	707-120B	11	11	38	39	40	41	42	42	42
9	720B	11	11	37	38	39	40	42	42	42
10	DC-8-55	11	11	27	28	29	31	34	36	36
11	DC-8-61/63	11	11	30	32	33	35	36	36	36
12	CONVAIR-990	11	11	28	30	31	32	34	34	34
13	4E NTJ 707-120/320	19	19	21	22	23	24	25	26	26
14	720	18	18	21	22	23	24	25	25	25
15	DC-8-30	20	20	21	22	23	24	25	26	26
16	CONVAIR-880	19	19	22	23	24	25	25	25	25
17	VC-10	19	19	27	28	29	30	31	32	32
18	STOL F-28-2000	1	1	61	62	62	0	0	0	0
19	SST CONCORDE	17	17	76	76	77	77	78	78	78
20	2EWB A300 AIRBUS	13	13	50	51	51	52	53	0	0
21	3E MR WB DC-10-10	14	14	12	13	14	15	16	16	16
22	3 ENG WB L-1011	15	15	12	13	14	15	16	16	16
23	3E LR WB DC-10-30	14	14	56	56	57	58	59	60	60
24	3E LR WB STRETCH	14	14	56	57	58	59	84	85	85
25	4 ENG WB 747-200	16	16	6	7	8	9	10	11	11
26	747-100	16	16	1	2	3	4	5	5	5
27	747 STRETCH	16	16	79	79	80	81	82	83	83
28	DC9 W/SAM ENGINES	3	3	48	49	49	49	0	0	0
29	737 W/SAM ENGINES	6	6	43	44	45	45	0	0	0
30	727 W/SAM ENGINES	9	9	17	18	19	20	0	0	0
31	707 W/SAM ENGINES	12	12	27	28	29	31	34	36	36
32	DC8 W/SAM ENGINES	12	12	30	32	33	35	36	36	36
33	727ADV W/SAM ENG.	9	9	63	63	64	65	0	0	0
34	2ETPO F-27 FOKKER	4	4	54	54	54	0	0	0	0
35	LTJ GA	7	7	55	0	0	0	0	0	0
36	MTJ GA	10	10	66	66	66	0	0	0	0
37	HTJ GA	40	40	67	67	67	0	0	0	0
38	MTF GA	21	21	86	86	86	0	0	0	0
39	MTETP GA	22	22	87	87	0	0	0	0	0
40	LTEP6 GA	23	23	88	0	0	0	0	0	0
41	LSEP2 GA	24	24	89	0	0	0	0	0	0
42	LSEP4 GA	25	25	90	0	0	0	0	0	0
43	MSEP6 GA	26	26	91	0	0	0	0	0	0
44	MTEP10Q GA	27	27	92	0	0	0	0	0	0
45	MTEP10L GA	28	28	93	0	0	0	0	0	0
46	LQTF GA	29	29	94	94	94	0	0	0	0
47	HTF GA	30	30	95	95	95	95	0	0	0
48	F-101B,C,F MIL	31	31	96	96	96	96	96	0	0
49	F-104 MIL	32	32	97	97	0	0	0	0	0
50	F-5A,B MIL	33	33	98	98	0	0	0	0	0
51	F-5E MIL	34	34	99	99	0	0	0	0	0
52	T-33A MIL	35	35	100	100	100	0	0	0	0
53	C-5A MIL	36	36	101	101	101	101	101	101	101
54	C-141A MIL	37	37	102	102	102	102	102	102	0
55	C-130E MIL	38	38	103	103	103	103	103	0	0
56	C-130H,N,P MIL	39	39	104	104	104	104	104	0	0
57	C-131 MIL	41	41	68	68	68	0	0	0	0

FIGURE 1.4- 1 AIRCRAFT DEFINITIONS

approach parameters. Each of these options allows the user to replace a data set which resides in the data base. The key to the replacement is the identification number of the existing set of data which is available from Figure 1.4.1.

Commercial Aircraft

The commercial jets represent the most extensive portion of the INM data base. The principle sources of most of the information were obtained through contracts with the three major U.S. airframe manufacturers, Boeing, Lockheed, and McDonnell-Douglas. Because the commercial jets formed the nucleus of the original INM data base, the data that represent these aircraft are the most in need of verification or revision. Two programs, INM Validation and Improvements in FAA INM, are underway in these areas.

Through the use of extensive statistical analysis, the validation study investigates the accuracy and suitability of the INM in calculating aircraft noise exposure by: (1) assessing the sensitivity and controllability of the noise model to thrust assumptions, (2) examining the agreement between the noise model in calculating single noise events and the actual measurement of those events, and (3) investigating noise curves used in calculating noise exposure. Data for the analysis are being obtained from field observations of noise from air carrier flight operations over verious permanent noise monitoring sites near Washington National and Dulles International Airports. A report on phase 1 of the analysis will be released in the very near future.

Another program is underway to update the INM data base. In particular, a major task will be to update the departure profiles of the commercial jet aircraft in the data base. The commercial jet departure profiles of the data base conform to an FAA recommendation of January 18, 1974 (Advisory Circular 91-39). The procedure incorporates a reduction in engine power from takeoff thrust to normal climb thrust at an altitude of 1500 feet above the ground after takeoff with subsequent acceleration and climb after passing through 3000 feet by changing deck angle and retracting the flaps. In December 1976, the Air Transport Association of America (ATA) disseminated a standard departure procedure which differed from that recommended in AC 91-39. In the ATA procedure. takeoff thrust is maintained to an altitude of 1000 feet above the ground at which point the deck angle is lowered and flaps are retracted while engine power is reduced from takeoff thrust to normal climb thrust. This initial acceleration is terminated when flaps are retracted with subsequent acceleration and climb after passing through 3000 feet. The improvements to the INM program will update the departure profiles to the standardized noise abatement departure profiles as described in Advisory Circular 91-53, released on November 17, 1978. The new FAA recommended procedure is very similar to the ATA procedure with the exception that upon retracting flaps, all airplanes with low bypass ratio engines should reduce engine power to a thrust below normal climb thrust but in no case lower than that necessary to maintain the final takeoff engine/out climb gradient.

There are two exceptions to standard INM departure procedure in the group of commercial jets. The departure profiles of the Airbus (A 300-B), which is the latest addition to the commercial jet class, already prescribe to the latest FAA recommendation (AC 91-53). The Concorde holds the unique position in the data base in that the differences in the airplane's takeoff profiles are in the applications of a 4 percent climb segment.

General Aviation

Because of the nature of the sources of information, the general aviation aircraft in the INM data base are described by general category rather than by specific model names as are done for both the commercial and military aircraft. Figure 1.4.2 presents the definitions of the general aviation aircraft names given in the data base. For each of the general aviation aircraft, one departure profile is available.

Military

The military aircraft are the major additions to the INM data base since Version 1. The following fighter aircraft all use afterburner power during the standard takeoff: F-5A/B, F-5E, and F-104. For each of the military aircraft, one departure profile is available. Two of the propellor-driven military aircraft, C-103E and C-131, are essentially equivalent to two commercial category aircraft, Lockheed Electra and Convair 340/440, respectively.

Name	Description
LTJ	Light Turbojet (e.g., Lear 24/25)
MTJ	Medium Turbojet (e.g., Sabreliner 60)
HTJ	Heavy Turbojet (e.g., Jetstar I)
MTF	Medium Turbofan (e.g., Sabreliner 80)
MTETP	Medium Twin Engine Turboprop (e.g., Twin Otter)
LTEP6	Light Twin Engine Piston, 4-6 place (e.g., Cessna 310)
LSEP2	Light Single Engine Piston, 2 place (e.g., Cessna 150, Grumman American TRainer)
LSEP4	Light Single Engine Piston, 4 place (e.g., Cessna 172, Piper Cherokee Warrior, Piper 180)
MSEP6	Medium Single Engine Piston, 4-6 place (e.g., Cessna 182, Piper Cherokee Six)
MTEP10Q	Medium Twin Engine Piston, 6-10 place (Quiet) (e.g., Commander 685)
MTEP10L	Medium Twin Engine Piston, 6-10 place (Loud) (e.g., Beech Queen Air, Piper Navajo Chieftain)
LQTF	Light Quiet Turbofan (e.g., Cessna Citation)
HTF	Heavy Turbofan (e.g., Jetstar II, Gulfstream II)

FIGURE 1.4-2 GENERAL AVIATION DESCRIPTIONS

Specific Program Limits

15 Runways

88 Ground Tracks

30 Aircraft Selections any Combination of Retrieved or Defined

99 Takeoff Profiles

50 Approach Profiles

24 Sets of Approach Parameter Data

24 Sets of Noise Curve Data

2000 Total Operations or 200 Aircraft/Track Combinations in the Aircraft Traffic Mix

25 Takeoff Modifications

1.4 NOTE TO PREVIOUS USERS OF THE INM

Users familiar with Version 1.2 of the INM will find that using the Input Module is not identical to using punched cards for input. The major differences are:

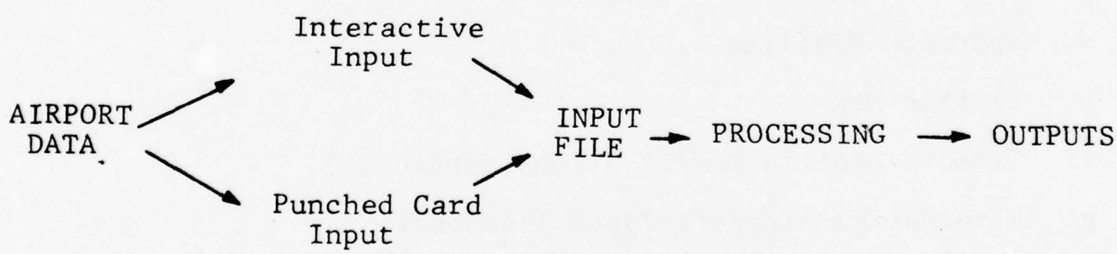
1. Spacer and section numbering lines are inserted by the program without any user participation.
2. Aircraft retrieval data are properly recorded by the Input Module without notifying the user. It is not mentioned in this guide until punched card input is described.
3. Entries in some sections (runways, approaches, profiles, etc.) are numbered sequentially, starting with "one."

   This is very different for approach profiles because in Version 1.2 of the INM, profiles were numbered from 101 to 150.

1. Aircraft Retrieval - "107" appears in columns 1 to 3 of a card. The aircraft identification numbers appear on the following cards (up to four). User defined aircraft types (a new option) should then be listed here.
2. Approach Profiles are now numbered 301 to 350.
3. Aircraft Mix Cards have been changed. The aircraft type field is the first three columns. The ground track and approach profile numbers are shifted one column to the right. This makes use of the formerly unused eighth column. The rest of the card is unchanged.

2.0 ELEMENTS OF AN AIRPORT CASE STUDY

INM Version 2 contains the option of providing input using either the interactive, conversational Input Module or punched cards (as in Version 1). Each method will be described in this guide. The addition of the interactive method does not alter any section of the INM program since it produces an input file identical to the one produced from punched cards. The following flow diagram shows the overall relationship between the two methods.



The input section will be presented as follows:

- o Description and assistance to the user in understanding the data required to produce a case (runways, ground tracks, approach profiles, traffic mix, and the optional sections, aircraft types, approach parameters, takeoff profiles, and noise curve data and takeoff modifications).
- o How to assemble and record the necessary data.
- o The interactive method for preparation of a case.

Other interactive features include previewing and editing.

Instructions for the punched card input instructions and processing follow.

2.1 GENERAL DESCRIPTION OF AIRPORT CASE STUDY ELEMENTS

OVERVIEW

The user is required to provide at least five and up to ten types of data describing the airport and its associated activity in order to run the model, i.e.;

a. Airport Altitude and Temperature

b. Runway Configuration

c. Track Definition

d. Approach Profiles

e. Traffic Mix

f. Takeoff Profile Modifications (optional)

g. Alternative Aircraft Types (optional)

h. Alternative Takeoff Profiles (optional)

i. Alternative Noise Curve Data (optional)

j. Alternative Approach Parameters (optional)

Options "g" to "j" were not available in Version 1. The following sections (2.1.1 - 2.1.5) describe the types of input data that must be present in every case. Section 2.2 describes data that may be included as an option.

2.1.1 Altitude and Temperature

The altitude and temperature data consists of the airport altitude above sea level in feet and the average daily airport temperature in degrees Celsius for the period under consideration. If the scenario reflects a typical hot day, then the average summer temperature is entered. Most scenarios will require the average annual temperature.

2.1.2 The Runway Definition

The runway definitions establish the airport geometry and its relationship to the surrounding area. First, the user must define a cartesian coordinate system with which to describe the airport. The unit of distance is the foot and the positive X- and Y- axes must run east and north, respectively, as on a typical map. The placement of the origin, point (0,0), is arbitrary; however, for computational precision the distances from the origin to the runways should be small. The user determines the X, Y-coordinates of each runway end point giving the INM the information it needs to reconstruct the user's coordinate system.

It may be desirable to locate the origin so that all runways are in the first quadrant and thus have positive coordinates. If the origin is located at the start or end of a runway, the required calculations of runway starts and ends will be simplified. After selection of the origin, the user may use simple trigonometric

techniques or a graph paper overlay to determine the X-Y values of the points on the runways. Figure 2.1-1 illustrates the coordinate system for the example airport, the origin of which has been located at the west end of runway 09/27 and the Y-axis points north. Any X-coordinate of a point to the east of the origin and any Y-coordinate to the south of the origin must be a negative number.

Two pairs of X, Y-coordinates, each corresponding to a runway endpoint, define a runway. Each coordinate pair, or runway end, has two definitions, one corresponding to departures and one to arrivals. The first pair locates the end of the runway where a departing aircraft begins its takeoff roll; this is the far end of the runway as viewed from an approaching aircraft. The second pair locates the end of the runway which connects with the track and is defined as the takeoff flyover end and the approach end. Figure 2.1-2 displays the relationship of the pairs of coordinates to the type of aircraft operation.

2.1.3 Track Definition

The track definition consists of all information needed to model a flight path's projection on the ground up to the runway end. (Figure 2.1-3) A single track can be used for any number of operations, both arrivals and departures (See Section 2.1.5). Up to 88 tracks can be specified. Each track will be associated with a runway. Ordinarily, each runway will be associated with several tracks. In this scheme, one need not model separate tracks

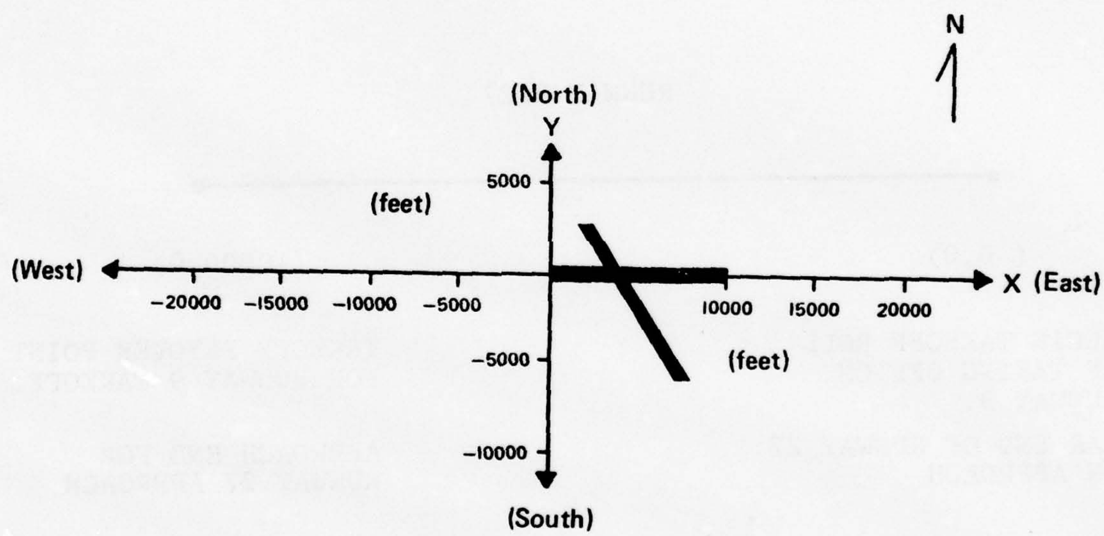


FIGURE 2.1-1. COORDINATE SYSTEM FOR THE EXAMPLE AIRPORT

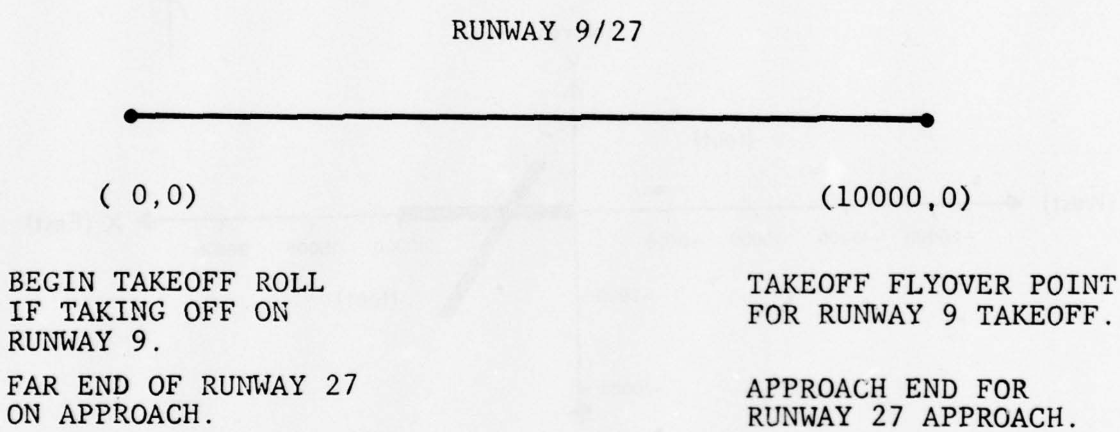


FIGURE 2.1-2. THE RUNWAY END POINTS

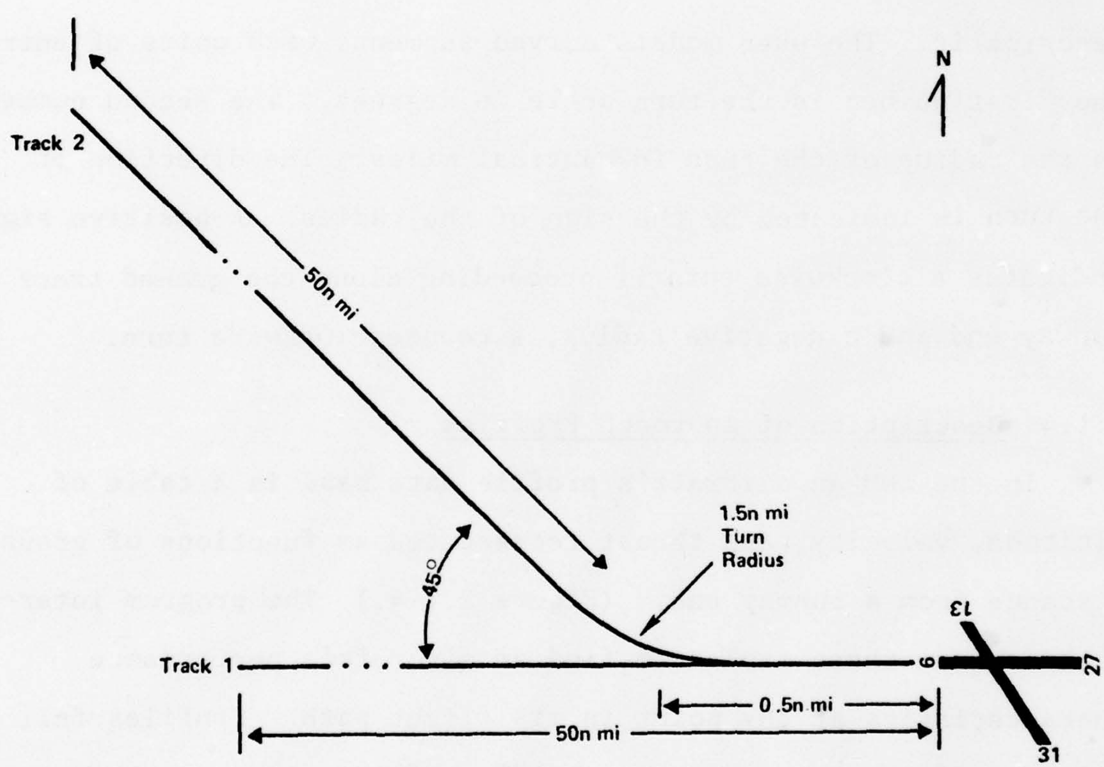


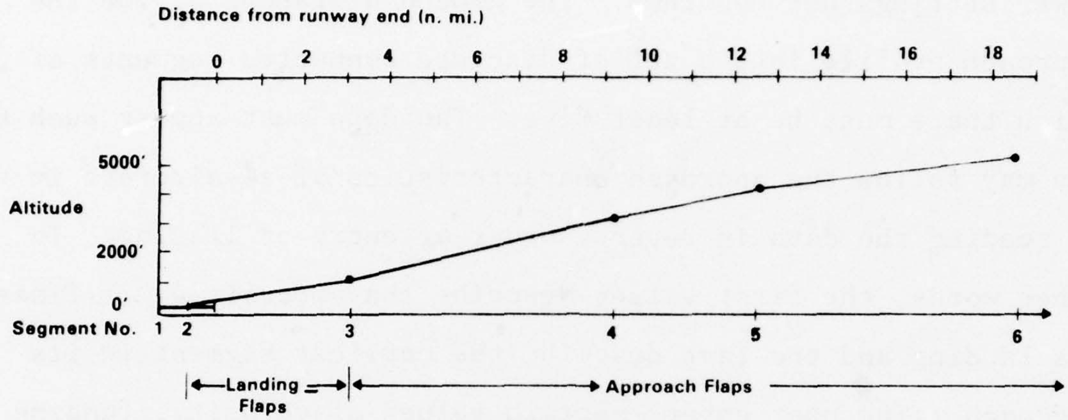
FIGURE 2.1-3. TRACKS FOR RUNWAY NUMBER 9/27 OF EXAMPLE AIRPORT

for arrivals and departures which follow the same flight path projection. A track is made up of one or more segments which are either curved or straight. The first segment connects with the runway end and must be straight. For it and all subsequent straight segments, only a length in nautical miles is necessary to describe it. The user models curved segments with pairs of entries. The first number is the turn angle in degrees. The second number is the radius of the turn in nautical miles. The direction of the turn is indicated by the sign of the radius. A positive sign indicates a clockwise turn if proceeding along the ground track from runway end and a negative radius, a counterclockwise turn.

2.1.4 Description of Approach Profiles

In the INM an aircraft's profile data base is a table of altitude, velocity, and thrust represented as functions of ground distance from a runway end. (Figure 2.1-4.) The program interpolates from these tables to find an aircraft's performance characteristics at any point in its flight path. Profiles fall into one of two categories: takeoff profiles and approach profiles. Each is handled somewhat differently by the model and will be discussed separately here. Takeoff profiles are discussed in Section 2.2.2.

All approach procedures used for the airport must appear in the input data. Each approach profile is modeled with a set of four values, which provide the INM with a set of ground distances



STANDARD 3 DEGREE APPROACH

Point	1	2	3	4	5	6	7
Distance from runway end (n. miles)	Stopping Distance	-.165	2.975	9.255	12.395	18.675	
Height above Airport Ground Level (ft)	0	0	1000	3000	4000	5000	
Air Speed (Kts)	32.	LANDING	LANDING	LANDING	LANDING	LANDING	
Thrust* (Pounds per engine)	REV	3° GLIDE, LANDING	3° GLIDE, APPROACH	3° GLIDE, APPROACH	3° GLIDE, APPROACH		

* Thrust refers to the approach segment between the lower segment point and the next higher numbered point.

FIGURE 2.1-4. EXAMPLE OF APPROACH PROFILE

from the approach end of the runway, reference values of altitude and velocity at each of these distances, and an indication of the power settings between them. The ground distances divide the approach profile into a set of discrete connected segments of which there must be at least five. The data must appear such that one may follow the approach characteristics of an aircraft in time by reading the data in reverse order of entry or listing. In other words, the first values describe the aircraft as it finishes its landing and the last describe the earliest segment in its approach. The user enters certain values of velocity, landing roll distance, and approach thrust indirectly by using indicators. These indicators refer the INM to the appropriate data locations in the data base or to those provided by the user. (See Section 2.2.3.) This scheme enables the user to model approaches for many aircraft types with only one approach profile.

A user may copy the example airport sample data for a 3° approach with transition from approach flap setting to landing flap setting at an altitude of 1000 feet, which is a common procedure. Profile data may also be calculated by the user.

2.1.5 Description of Aircraft Traffic Mix Data

The aircraft mix describes the type, magnitude, and arrangement of activity at an airport. (Figure 2.1-5.) The input consists of the average number of day, evening, and night operations per day on tracks defined in Section 2.1.3. Day is the period

	Aircraft Name
2E NB TF	DC-9-32
	DC-9-15
	BAC-111
	737/100-200
3E NBTF	727-200
	727-100
4E NBTF	707-320B/C
	707-120B
	720B
	DC-8-55
	DC-8-61/63
	Convair-990
4E NTJ	707-120/320
	720
	DC-8-30
	Convair-880
	VC-10
STOL	F-28-2000
SST	CONCORDE
2 EWB	A300 AIRBUS
3E MRWB	DC-10-10
3 ENG WB	L-1011

FIGURE 2.1-5. AIRCRAFT STORED IN THE INM

Aircraft Name	
3E LRWB	DC-10-30
3E LRWB	STRETCH
4 Eng. WB	747-200
	747-100
	747 STRETCH
	DC9 w/SAM Engines
	737 w/SAM Engines
	727 w/SAM Engines
	707 w/SAM Engines
	DC8 w/SAM Engines
	727 Adv. w/SAM Engines
2 ETPQ	F-27 FOKKER
LT J GA	Light Turbo Jet
MTJ GA	Medium Turbo Jet
HTJ GA	Heavy Turbo Jet
MTF GA	Medium Turbo Fan
MTETP GA	Medium Twin Engine Turbo Prop
LTEP6 GA	CESSNA 310
LSEP2 GA	CESSNA 150
LSEP4 GA	CESSNA 172
MSEP6 GA	CESSNA 182
MTEP10Q GA	COMMANDER 685

FIGURE 2.1-5. AIRCRAFT STORED IN THE INM (CONTINUED)

Aircraft Name	
MTEP10LGA	BEECH QUEENAIR
LQTF GA	CESSNA CITATION
HTF GA	JETSTAR II
Military	F-101B, C, F
	F-104
	F-5A, B
	F-5E
	T-33A
	C-5A
	C-141A
	C-130E
	C-130H, N, P
	C-131

FIGURE 2.1-5. AIRCRAFT STORED IN THE INM (CONTINUED)

between 7 a.m. and 7 p.m., evening is the period between 7 p.m. and 10 p.m., and night is between 10 p.m. and 7 a.m. The specification of time of day is an important factor in the calculation of four of the measures of airport noise which are available in the INM, NEF, Ldn, CNEL, and TA. The contribution of night operations to total exposure is more heavily weighted than the contribution of day operations for NEF, Ldn, and CNEL. The evening operations are more heavily weighted than the day operations but weighted less heavily than the night operations in the determination of total exposure as measured by CNEL. In grid analysis, TA calculations are broken down into three daily periods, total, evening and night. (See Section 3.2.) The preparation of operations data is based on knowledge of schedule, demand, runway utilization and air traffic control procedures in addition to the runway and track layout.

Departures and arrivals are further divided into 7 stage-length categories which correspond to the approximate flight distances. This allows the INM to make necessary adjustments based on takeoff weight which in turn is based on stage length.

0-500	nautical miles
500-1000	" "
1000-1500	" "
1500-2500	" "
2500-3500	" "

3500-4500	nautical miles	
4500 and greater	"	"

Not all aircraft can fly all of these stage lengths (e.g., a Cessna 310's range is less than 500 miles). The Input Module will not accept a departure beyond an aircraft's maximum possible stage length. Table 3.1-1 lists the maximum stage length for each aircraft type.

To record the aircraft traffic mix data for an airport, it is necessary to make one entry for each aircraft type, and track combination that occurs. For example, Convair 990's land using track #3, and track #1; two entries for Convair 990's will be needed. The INM contains data on all the aircraft listed in Figure 2.1-5.

It is not necessary that an aircraft/profile combination have both arrivals and departures, or that the numbers of arrivals and departures be equal.

2.2 OPTIONAL PARAMETERS

The user of the INM may change some types of data that are normally provided by the INM program. These changes are purely optional; if the user does nothing, the proper values will be utilized from the INM data base. The following optional changes may be used.

1. The user may add new aircraft types or change the properties of aircraft that are already part of the INM data base.

2. The user may add takeoff profiles or change takeoff profiles that are already part of the INM data.

3. Aircraft performance data can be specified for newly added aircraft or changed for aircraft that are already included in the INM.

4. Alternative noise vs. slant-distance tables can be specified by the user. These are new noise curves which have no comparative set in the data base.

5. The user may specify changes in some takeoff profiles without replacing the entire profile. These modifications affect takeoffs on certain ground tracks as opposed to affecting all occurrences of a takeoff profile.

Users should be cautious in using these features to change data that is ordinarily provided by the INM. In studies required for regulatory purposes, the user's changes may not be acceptable to the regulator. All such changes should be carefully considered before use.

2.2.1 Aircraft Definitions

The user may add new aircraft to an airport data file so that the operation of aircraft not currently included in the INM data base can be part of a case. It is also possible to alter the properties of aircraft which are already included in the INM data base.

An airplane definition includes the following information:

An identifying number

An aircraft name

A noise curve number which identifies the noise vs. slant-distance tables associated with the aircraft

An approach parameter number which associates the aircraft type with a set of approach parameter values

A takeoff profile number for each possible trip length category (Section 2.1.4)

For new aircraft types, these must all be provided. Usually, the user must create a new set of approach parameters. The noise curve number and takeoff profiles may be selected from those already in the INM data base, or new ones may be created.

When changing an aircraft type that is already part of the INM, it is not necessary to change all of its properties. If a new noise curve is not specified the INM will retrieve and use the noise curve from the INM data base.

2.2.2 Takeoff Profiles

Inclusion of takeoff profiles in the input data is optional. The user should only include them if the profiles stored in the data base do not suit his needs. If the user wishes to replace a stored takeoff procedure and preserve the numbering scheme by which the profile is referenced in the data base, the user needs only enter the new profile under the identification number of the data base profile it replaces. Under these circumstances he need

not enter an aircraft definition in Section 2.2.1. Alternatively, the user may wish to include a profile which has no counterpart in the data base. This may occur either in the case of a new, user-created aircraft or a redefined data base aircraft. Notice that in the data base, several aircraft use the same profiles. Replacement of such profiles as described above will affect all aircraft using them. One may avoid this side effect by including new aircraft-specific profiles.

Takeoff profiles are defined in a manner similar to Approach Profiles Sets. Four values are required to define seven segments. See Section 2.1.4. In addition to ground distance, altitude, velocity and power setting data, a Takeoff Profile also requires that the number of engines being used and the aircraft's gross takeoff weight be specified.

The Takeoff Profile does not use any indirect indicators (Approach Profiles do). Thus each Takeoff Profile is very specific. The segments of the Takeoff Profile are entered (and read by the INM) in the order that they occur as the aircraft takes off (this is the reverse of the case for approach profiles).

2.2.3 Alternative Approach Parameters

When the user specifies an approach profile (See Profile Section 2.1.4), indicators are used to tell the INM to find values of various performance characteristics for each aircraft using the profile. This information may be retrieved either from the

data base or from entries provided by the user in this section and includes values of the following for each aircraft: landing weight, number of engines, stop distance from touchdown, approach speed, and thrust values for each of the eight thrust setting indicators described in Section 3.2.1. Approach parameters are stored for each aircraft in the data base under the same identification number as that under which each aircraft's noise curve is stored. The user may replace a data base approach parameter set by entering one in this section under the same number which the data base uses. Notice, however, that several aircraft may use the same approach parameters. If this is the case, other aircraft will be affected, but if the user wishes to change only those parameters which pertain to a single aircraft, he must change the aircraft's definition (See Section 3.1.6) and enter the approach parameters under a new identification number.

2.2.4 Alternative Noise vs. Distance Tables

The INM data base contains sets of EPNL vs. distance tables and a like number of NEL vs. distance tables. Each set consists of up to six noise curves, each noise curve corresponding to a different power setting. A noise curve is defined by a table of eight noise levels at the eight slant range distances of 200, 400, 600, 1000, 2000, 4000, 6000, and 10,000 feet. The power setting is usually thrust in pounds per engine

and given in units of pounds per engine. However, any power unit may be used as long as it is consistent for all noise curves, takeoff profiles, and approach parameters used by a particular aircraft type. Each noise vs. distance data set is assigned to an aircraft in the data base by the association of an aircraft identification number with a noise curve identification number. An aircraft's EPNL noise curves and NEL noise curves are grouped together under the same identification number. The Data Base Report presents all of the data base noise curves in this form. A noise data set must be defined by noise curves for anywhere from two to six power settings.

The input section allows the user to enter noise vs. distance tables not available in the current INM data base. The new noise data must follow the conventions of the standard data base described above. No entries may be made in the noise vs. distance tables section without the presence of aircraft definitions in which new noise curves have been identified. The user must include the three kinds of data required by this section: noise curve identification data, thrust setting data, and noise curve levels.

The standard data base contains a third unit of aircraft noise, Time Above (TA), besides EPNL and NEL. TA is the time of exposure to aircraft noise above a specified A-weighted sound level threshold. Because of the complexity of the mathematical

variables used to compute TA, the user cannot define his own TA data set. Each noise vs. distance data set in the standard data base is associated with a TA data set also in the standard data base. However, the user does not have the capability to associate a new noise vs. distance data set with a TA data set. The INM will not calculate TA for those cases involving user created noise vs. distance data sets because the TA data sets for those particular aircraft types are missing. An example of this is given in Section 3.2.2.

2.2.5 Takeoff Profile Modification

Occasionally the user may desire to modify a set of standard takeoff profiles without the benefit of the substantial performance information required in Section 2.2.2. In this section the user can modify any portion of the standard profile using one of five types of modification: altitude restriction, takeoff power, climb power, engine-out level flight power, or specified climb gradient. This section does not apply to either the military or general aviation aircraft in the INM data base. The user must override the modifications for these aircraft with the procedure described below.

The standard takeoff procedure for commercial jet aircraft in the INM data base is one which was commonly used by the domestic airlines prior to December 1976. This procedure is still in use today despite the formalization of a different procedure by the

Air Transport Association in December 1976.

A takeoff profile modification is assigned to one or more tracks. All departing aircraft on these track(s) are affected unless an override is used. The user may exclude any of the aircraft on the track from modification by using the override function. The override applies to only the aircraft types with noise curve identification numbers in the INM data base that have an override mode. The override modes are indicated by integers between 0 and 3. The definitions of the override modes are:

0 (or blank) - accept any modification

1 - accept no modification of any type

2 - accept engine-out cutback only

3 - accept takeoff or climb power only

Thus, any aircraft departing on a track which is subject to profile modification can have full, partial or no exemption from the modification depending upon the override mode assigned to that particular aircraft's noise curve identification number.

The modification definition identifies the type of modification, the segment of the profiles to be modified and the track(s) subject to the modification.

These are the types of modifications possible.

1. Altitude restriction (the aircraft cannot exceed the assigned altitude).
2. Takeoff power (the aircraft uses full power).

3. Climb power (the aircraft uses maximum continuous climb power).

4. Engine-out level flight power (the aircraft uses that power per engine which would maintain level flight if one engine was lost).

5. Specified climb gradient (the aircraft will alter power to maintain the climb gradient).

Modification type 5 requires that the user enter the climb gradient. Climb gradient is the ratio of the change in altitude to the change in ground distance in feet of climb over feet of distance. All modifications require that the start point and end point, respectively, of the modification be entered. These points are either altitudes, in feet, above the runway, or distances, in nautical miles, from the start of the takeoff roll. The user must specify which tracks (up to the maximum of ten) are affected by the modification.

2.3 EXAMPLE AIRPORT DESCRIPTION

A hypothetical airport system has been constructed to assist the user in preparing a case for the INM and in assessing the impacts of aircraft noise. The example airport, illustrated in Figure 2.3-1, will be referenced throughout the following discussions.

The airport system described below is given only as an example. The airport's operating characteristics are entirely

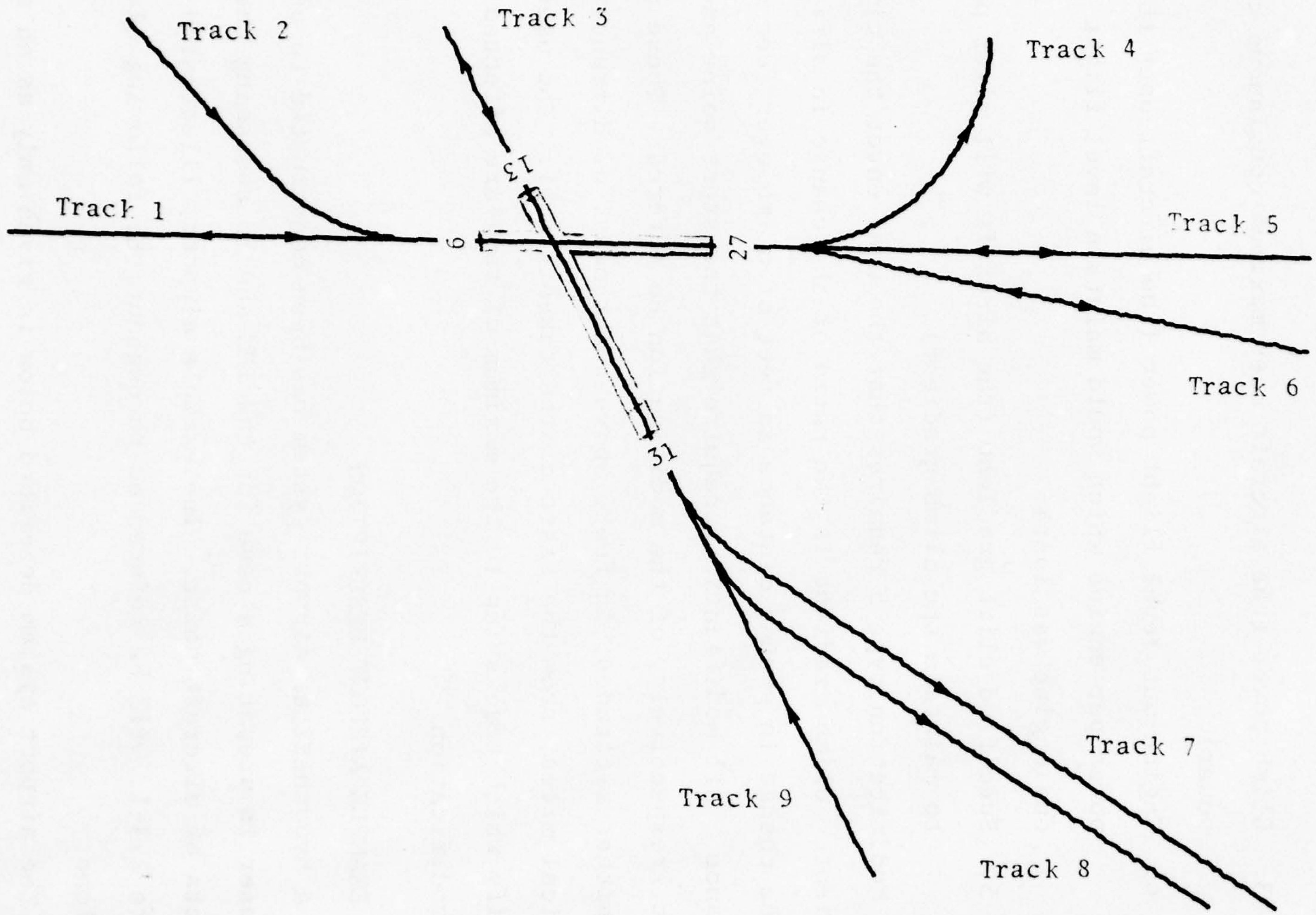


FIGURE 2.3-1. EXAMPLE AIRPORT (PLOTTED BY COMPUTER)

fictitious and should not be construed as representative of FAA standards.

Assume the following definitions at the example airport:

- o Airport elevation is at mean sea level.
- o Ambient temperature near the surface is 15^{o}C.
- o Prevailing wind conditions are calm.
- o Runways 9/27 and 13/31 (10,000 feet and 10,296 feet respectively) are utilized at the example airport.
- o Nine ground tracks are used for takeoffs and/or landings.
- o Three types of approach profiles are used at the example airport:
  1) standard 3^{o} approach for commercial aircraft,
  2) standard 3^{o} approach with a level segment for commercial aircraft,
  3) 3^{o} approach for general aviation aircraft.
- o The magnitude and mix of the traffic is typical for a small to medium hub airport.
- o Four aircraft types, BAC-111, 727-200, 707-120B and a medium-sized general aviation single engine piston aircraft with four to six seats (MSEP6), are retrieved from the data base in standard form.
- o The takeoff profile of all aircraft using tracks 7 and 8 are restricted to a 4% climb gradient from a point 3 n mi from start to takeoff roll to an altitude of 8000 feet.

3.0 INPUT CASE PREPARATION

Section 2 contains general descriptions of each of the required and optional input data elements. Section 3 will describe the preparation of the input data elements, specifically as required by INM. Data worksheets are provided in Appendix D of the manual. It should be noted that the INM may be run with only the following input elements.

3.1.1 Runway Data

3.1.2 Track Data

3.1.3 Approach Profile Data

3.1.4 Aircraft Traffic Mix Data

For more detailed and complex cases, any or all of the following options may be added to the above four elements by the user.

3.1.5 Optional Aircraft Types Data

3.1.6 Optional Takeoff Profile Data

3.1.7 Optional Approach Parameter Data

3.1.8 Optional Noise Curve Data

3.1.9 Optional Takeoff Modification Data

Thus a relatively simple case may be prepared with the four required elements and (automatically) use of the extensions stored in the INM data base. On the other hand, a user may modify

or create selected new data base elements. The example airport describes the use of all required and optional elements.

The first step, in running an airport case study using the Integrated Noise Model, is to gather the necessary data and organize it in the way required by the program.

While the INM contains information about aircraft performance and noise, the user must provide all the data about the airport and its operations. The user may also wish to add to or change some data provided by the INM.

The necessary data can be most easily recorded on data sheets. Two example airport studies will be used to describe the preparation of the data sheets. The example airport used to provide data described in Section 3.1 includes the data required for every case study. This is referred to as Example 1 in later sections. Section 3.2 adds optional data to expand Example 1 into Example 2. In Appendix D there are blank data forms that the user may copy and use to record airport data. These forms have been designed so that the user can be sure that a completely filled out form will provide all the information required by the INM. The questions on the form correspond to the prompts given by the Input Module on the user's manual. The person entering a case into the INM using the Input Module need only match the query on the terminal with the coding form and enter appropriate data that follows.

Experienced users may not require the preparation of coding sheets which are provided solely for user convenience.

3.1 RECORDING AIRPORT DATA

The first data sheet used will be the Runway Data Sheet.

The first three entries on the runway data sheet are, strictly speaking, not runway data. The first entry

DATA FILE NAME:

provides a name by which the airport data file can be referred to. Limits on the length of the name depend on the computer system being used. The details can be provided by computer support personnel.

The next two entries

WHAT IS THE AIRPORTS ALTITUDE IN FEET ABOVE SEA LEVEL?

WHAT IS THE AVERAGE AMBIENT TEMPERATURE IN DEGREES CELSIUS?

are airport physical properties that affect aircraft performance and, indirectly, sound transmission.

3.1.1 Runway Data

The rest of one or more Runway Data Sheets can be used to record the definitions of up to 15 runways.

The number of runways should be entered after

HOW MANY RUNWAYS ARE THERE?

The Input Module automatically identifies each runway based on

RUNWAY DATA SHEET

DATA FILE NAME: EXAMPL.DAT

WHAT IS THE AIRPORTS ALTITUDE IN FEET ABOVE SEA LEVEL?
WHAT IS THE AVERAGE AMBIENT TEMPERATURE IN DEGREES CELSIUS?

```
RUNWAY NUMBER 1
START:  X = 10000
        Y = 0
END:    X = 0
        Y = 0
RUNWAY NAME TAKEOFF:  27          LANDING: 9
COMMENTS: T.O. RWY 27

RUNWAY NUMBER 2
START:  X = R
        Y =
END:    X =
        Y =
RUNWAY NAME  TAKEOFF:             LANDING:
COMMENTS: T.O. RWY 9

RUNWAY NUMBER 3
START:  X = 7000
        Y =-7000
END:    X = 2000
        Y = 2000
RUNWAY NAME  TAKEOFF: 31          LANDING: 13
COMMENTS: T.O. RWY 31

RUNWAY NUMBER 4
START:  X = R
        Y =
END:    X =
        Y =
RUNWAY NAME  TAKEOFF:             LANDING:
COMMENTS: T.O. RWY 13

RUNWAY NUMBER 5
START:  X =
        Y =
END:    X =
        Y =
RUNWAY NAME  TAKEOFF:             LANDING:
COMMENTS:

RUNWAY NUMBER 6
START:  X =
        Y =
END:    X =
        Y =
RUNWAY NAME  TAKEOFF:             LANDING:
COMMENTS:
```

the order in which it is entered. The first runway entered will be 1, the next, 2, etc.

The first four entries under each runway definition are the X,Y coordinates of the beginning and end of the runway. The first pair (START: X = , Y =) locates the point where a departing plane would start its takeoff roll. The second pair locates the end of the runway. These points also correspond to the end of the runway as viewed from an approaching aircraft and the approach end of the runway, respectively.

The next two entries are runway names. Each entry may be no more than 3 characters long

RUNWAY NAME TAKEOFF:

LANDING:

These names are used by the INM in printing summary statistics. The names should refer to the runway headings in a consistent manner. It is recommended that the user name the runways in the standard way. Runway 1, when used for takeoffs, has a heading of 270^{o}, so it should be named 27 for takeoffs and 9 for landings.

COMMENTS:

Accepts a short (17 character) description of the runway. This is provided only for the users convenience.

Runways frequently occur in pairs, having the same surface, but different directions. To ease the entry of such runway pairs, the user may enter the reverse of any runway by entering R as

the entry of the very next runway.

START: X = R

This indicates the current entry is the reverse of the last entry. The definitions of the two pairs of coordinates are reversed. The INM Input Module will make the correct entry of coordinates.

In the sample airport, runway 2 is the reverse of runway 1 and runway 4 is the reverse of runway 3. Only the "Comments" entry is needed for such a runway.

3.1.2 Track Data

The track Data Sheet can be used to record all the data needed to define one flight track. Use a separate sheet for each ground track.

On the first track entry sheet, write the number of tracks to be entered after

HOW MANY GROUND TRACKS ARE THERE?

On every sheet, write the number of the particular track being entered. Tracks are numbered (by the program) in the order in which they are entered into the airport data file (the first track entered is 1, second is 2, etc.) This track number will be the sole identifier that the INM will use to identify the track. Write the number of the track after

TRACK:

TRACK DATA SHEET 1

HOW MANY TRACKS ARE THERE? 9
WHICH RUNWAY DOES THE TRACK START ON? 1
HOW MANY SEGMENTS ARE ON THE TRACK? 1
SEGMENT 1 LENGTH: 50

SEGMENT 2	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 3	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 4	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 5	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 6	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 7	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 8	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 9	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 10	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 11	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 12	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 13	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 14	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 2

HOW MANY TRACKS ARE THERE?
WHICH RUNWAY DOES THE TRACK START ON? 1
HOW MANY SEGMENTS ARE ON THE TRACK? 3
SEGMENT 1 LENGTH: .5

SEGMENT 2	STRAIGHT OR CURVED: C	TURN ANGLE: 45
	LENGTH:	RADIUS OF TURN: 1.5
SEGMENT 3	STRAIGHT OR CURVED: S	TURN ANGLE:
	LENGTH: 50	RADIUS OF TURN:
SEGMENT 4	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 5	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 6	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 7	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 8	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 9	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 10	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 11	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 12	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 13	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 14	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 3

HOW MANY TRACKS ARE THERE?

WHICH RUNWAY DOES THE TRACK START ON? 3

HOW MANY SEGMENTS ARE ON THE TRACK? 1

SEGMENT 1 LENGTH: 50

SEGMENT 2 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 3 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 4 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 5 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 6 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 7 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 8 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 9 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 10 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 11 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 12 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 13 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 14 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 4

HOW MANY TRACKS ARE THERE?
WHICH RUNWAY DOES THE TRACK START ON? 2
HOW MANY SEGMENTS ARE ON THE TRACK? 5
SEGMENT 1 LENGTH: .5

SEGMENT 2	STRAIGHT OR CURVED: C	TURN ANGLE: 90
	LENGTH:	RADIUS OF TURN: -1.5
SEGMENT 3	STRAIGHT OR CURVED: S	TURN ANGLE:
	LENGTH: 1.5	RADIUS OF TURN:
SEGMENT 4	STRAIGHT OR CURVED: C	TURN ANGLE: 45
	LENGTH:	RADIUS OF TURN: -1.5
SEGMENT 5	STRAIGHT OR CURVED: S	TURN ANGLE:
	LENGTH: 50	RADIUS OF TURN:
SEGMENT 6	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 7	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 8	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 9	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 10	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 11	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 12	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 13	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 14	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 5

HOW MANY TRACKS ARE THERE?
WHICH RUNWAY DOES THE TRACK START ON? 2
HOW MANY SEGMENTS ARE ON THE TRACK? 1
SEGMENT 1 LENGTH: 50

SEGMENT 2 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 3 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 4 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 5 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 6 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 7 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 8 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 9 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 10 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 11 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 12 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 13 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 14 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 6

HOW MANY TRACKS ARE THERE?
WHICH RUNWAY DOES THE TRACK START ON? 2
HOW MANY SEGMENTS ARE ON THE TRACK? 3
SEGMENT 1 LENGTH: .5

SEGMENT 2 STRAIGHT OR CURVED: C   TURN ANGLE: 10
LENGTH: RADIUS OF TURN: 1.5

SEGMENT 3 STRAIGHT OR CURVED: S   TURN ANGLE:
LENGTH: 50   RADIUS OF TURN:

SEGMENT 4 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 5 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 6 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 7 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 8 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 9 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 10 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 11 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 12 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 13 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 14 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 7

HOW MANY TRACKS ARE THERE?
WHICH RUNWAY DOES THE TRACK START ON? 4
HOW MANY SEGMENTS ARE ON THE TRACK? 3
SEGMENT 1 LENGTH: .5

SEGMENT 2 STRAIGHT OR CURVED: C LENGTH:	TURN ANGLE: 30 RADIUS OF TURN: -1.5
SEGMENT 3 STRAIGHT OR CURVED: S LENGTH: 50	TURN ANGLE: RADIUS OF TURN:
SEGMENT 4 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 5 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 6 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 7 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 8 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 9 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 10 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 11 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 12 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 13 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:
SEGMENT 14 STRAIGHT OR CURVED: LENGTH:	TURN ANGLE: RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 8

HOW MANY TRACKS ARE THERE?
WHICH RUNWAY DOES THE TRACK START ON? 4
HOW MANY SEGMENTS ARE ON THE TRACK? 3
SEGMENT 1 LENGTH: 10

SEGMENT 2 STRAIGHT OR CURVED: C   TURN ANGLE: 30
LENGTH: RADIUS OF TURN: -1.5

SEGMENT 3 STRAIGHT OR CURVED: S   TURN ANGLE:
LENGTH: 50   RADIUS OF TURN:

SEGMENT 4 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 5 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 6 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 7 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 8 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 9 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 10 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 11 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 12 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 13 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 14 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 15 LENGTH:

TRACK DATA SHEET 9

HOW MANY TRACKS ARE THERE?

WHICH RUNWAY DOES THE TRACK START ON? 4

HOW MANY SEGMENTS ARE ON THE TRACK? 1

SEGMENT 1 LENGTH: 50

SEGMENT 2	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 3	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 4	STRAIGHT OR CURVED:	TTRN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 5	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 6	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 7	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 8	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 9	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 10	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 11	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 12	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 13	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:
SEGMENT 14	STRAIGHT OR CURVED:	TURN ANGLE:
	LENGTH:	RADIUS OF TURN:

SEGMENT 15 LENGTH:

Each track is connected to one runway's takeoff flyover end (approach end). Remember that ground roll is not considered part of a track. Write the identifying number of the runway (as recorded on the Runway Data Sheet) on the Track Data Sheet after

WHICH RUNWAY (USE THE NUMBER) DOES TRACK START ON?

After

HOW MANY SEGMENTS ARE ON THE TRACK?

enter the number of segments on the track. This will be 1 to 15.

Except for the first, second, and last segments, each segment requires an answer to

IS SEGMENT 3 STRAIGHT OR CURVED?

"S" means Straight, "C" means Curved. If the segment is straight, enter its length in nautical miles after

LENGTH:

If the segment is curved, enter the turn angle after

SEGMENT 3 TURN ANGLE IN DEGREES:

Both the radius and direction of the turn are indicated by the entry after.

RADIUS OF TURN IN NAUTICAL MILES:

The radius of the turn is given as positive if the turn is clockwise and negative if the turn is counter clockwise.

There are a number of rules that limit possible track segment configurations. Some of the limits are logical, others are based on the INM model's capabilities. Please note, the short connecting

segments discussed below (used between turns, for example) must be treated in every way as regular segments.

1) The first segment of a track must be straight. If the track is to take an immediate turn at the end of the runway, enter a very small straight first segment (0.0001 nmi).

2) The last segment of a track must be straight. If the track does not have a straight last segment, add one in order to continue the track out of the area of interest. An entry of 50 nautical miles will suffice.

3) No two contiguous segments can be straight. Such a combination must be entered as one straight segment. As a result, no track can have only two segments, and all second segments will be curved.

4) No single curved segment or pair of contiguous turns may be greater than 270 degrees. To represent a larger turn or a series of contiguous turns, short straight segments (0.0001 nmi) must be inserted between the turn segments.

5) A curved segment turning through 180 degrees, or more may not be contiguous with another curved segment. It must be bounded by straight segments, short ones if necessary.

6) Three curved segments may not be contiguous. A short straight segment must be inserted between two of them.

3.1.3 Preparation of the Approach Profile Data Sheet

Each approach profile will require one data sheet. On the first line of the first sheet enter the number of profiles to be in the airport data file after

HOW MANY APPROACH PROFILES ARE THERE:

On all sheets enter the number of the profile after

PROFILE NUMBER:

Approach profiles will be given identifying numbers by the INM Input Module based on the order of entry. The first approach profile entered will be number 1, the second number 2, etc. This number will identify the approach profile within the INM Input Module for one complete case.

Each profile should be given a description up to 68 characters long (may contain blanks) after

ENTER THE PROFILE LABEL:

This label is for the user's convenience in identifying the profile and does not affect the output of the INM.

After:

HOW MANY SEGMENTS ARE ON THE PROFILE?

enter the number of segments on the profile. There must be at least 5 segments on an approach profile and no more than 7 segments. A new segment should be defined for each major change in thrust setting along the approach.

For each segment end point, four values are required as follows

APPROACH PROFILE DATA SHEET 1

HOW MANY APPROACH PROFILES ARE THERE: 3

ENTER THE PROFILE LABEL: STANDARD 3 DEGREE APPROACH

HOW MANY POINTS ARE ON THE PROFILE? 6

FOR SEGMENT 1:
HEIGHT ABOVE RUNWAY: 0
AIR SPEED: 32
THRUST: REV

FOR SEGMENT 2:
DISTANCE FROM RUNWAY END: -.165
HEIGHT ABOVE RUNWAY: 0
AIR SPEED: LANDING
THRUST: LAND 3 DEGREE GLIDE SLOPE

FOR SEGMENT 3:
DISTANCE FROM RUNWAY END: 2.975
HEIGHT ABOVE RUNWAY: 1000
AIR SPEED: LANDING
THRUST: 3 DEG APPROACH GLIDE SLOPE

FOR SEGMENT 4:
DISTANCE FROM RUNWAY END: 9.255
HEIGHT ABOVE RUNWAY: 3000
AIR SPEED: LAND
THRUST: APPROACH 3 DEGREE GLIDE

FOR SEGMENT 5:
DISTANCE FROM RUNWAY END: 12.395
HEIGHT ABOVE RUNWAY: 4000
AIR SPEED: LAND
THRUST: APPROACH 3 DEGREE GLIDE

FOR SEGMENT 6:
DISTANCE FROM RUNWAY END: 18.675
HEIGHT ABOVE RUNWAY: 5000
AIR SPEED: LAND
THRUST:

FOR SEGMENT 7:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:

APPROACH PROFILE DATA SHEET 2

HOW MANY APPROACH PROFILES ARE THERE:

ENTER THE PROFILE LABEL: STANDARD 3 DEGREE APPROACH WITH LEVEL SEGMENT

HOW MANY POINTS ARE ON THE PROFILE? 6

FOR SEGMENT 1:
HEIGHT ABOVE RUNWAY: 0
AIR SPEED: 32
THRUST: REV

FOR SEGMENT 2:
DISTANCE FROM RUNWAY END: -.165
HEIGHT ABOVE RUNWAY: 0
AIR SPEED: LAND
THRUST: LAND 3 DEGREE GLIDE SLOPE

FOR SEGMENT 3:
DISTANCE FROM RUNWAY END: 2.975
HEIGHT ABOVE RUNWAY: 1000
AIR SPEED: LAND
THRUST: APPROACH 3 DEGREE GLIDE SLOPE

FOR SEGMENT 4:
DISTANCE FROM RUNWAY END: 9.255
HEIGHT ABOVE RUNWAY: 3000
AIR SPEED: LAND
THRUST: LEVEL APPROACH

FOR SEGMENT 5:
DISTANCE FROM RUNWAY END: 12
HEIGHT ABOVE RUNWAY: 3000
AIR SPEED: LAND
THRUST: APPROACH 3 DEGREE GLIDE

FOR SEGMENT 6:
DISTANCE FROM RUNWAY END: 15.14
HEIGHT ABOVE RUNWAY: 4000
AIR SPEED: LAND
THRUST:

FOR SEGMENT 7:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:

APPROACH PROFILE DATA SHEET 3

HOW MANY APPROACH PROFILES ARE THERE:
ENTER THE PROFILE LABEL: GA. 3 DEGREE APPROACH
HOW MANY POINTS ARE ON THE PROFILE? 6

FOR SEGMENT 1:
HEIGHT ABOVE RUNWAY: 0
AIR SPEED: 32
THRUST: LAND 3 DEGREE GLIDE SLOPE

FOR SEGMENT 2:
DISTANCE FROM RUNWAY END: -.165
HEIGHT ABOVE RUNWAY: 0
AIR SPEED: LANDING
THRUST: LAND 3 DEGREE GLIDE SLOPE

FOR SEGMENT 3:
DISTANCE FROM RUNWAY END: 2.975
HEIGHT ABOVE RUNWAY: 1000
AIR SPEED: LAND
THRUST: LAND 3 DEGREE GLIDE

FOR SEGMENT 4:
DISTANCE FROM RUNWAY END: 9.255
HEIGHT ABOVE RUNWAY: 3000
AIR SPEED: LAND
THRUST: LAND 3 DEGREE GLIDE

FOR SEGMENT 5:
DISTANCE FROM RUNWAY END: 12.395
HEIGHT ABOVE RUNWAY: 4000
AIR SPEED: LAND
THRUST: LAND 3 DEGREE GLIDE

FOR SEGMENT 6:
DISTANCE FROM RUNWAY END: 18.675
HEIGHT ABOVE RUNWAY: 5000
AIR SPEED: LAND
THRUST:

FOR SEGMENT 7:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:

1) The distance of the point (along the runway or ground track) from the runway approach end. This is provided by the Input Module for the first point, i.e., the aircraft stopping distance is inserted. Distances along the runway (after passing the runway approach end) must be negative. All distances must be in nautical miles. Enter after

DISTANCE FROM RUNWAY END:

2) The height of the point, in feet, above the runway, not above sea level. On and after touchdown, the height is zero (0). Enter after

HEIGHT ABOVE RUNWAY

3) The speed of the aircraft in knots as it crosses the point being described. For the first point, this will be the taxiing speed. For a number of points, such as touchdown, the speed will depend on the type of aircraft. To get the correct landing speed here (and at other points) write "LAND" instead of a number. The INM will insert the correct figure as needed. Enter after

AIR SPEED:

4) The thrust of the aircraft in pounds per engine. Each thrust entry is applied to the segment connecting the point specified to the next higher numbered point. The thrust specified for point No. 2 applies from point

No. 2 to point No. 3. Enter after
THRUST:

Since the sequence of thrusts required to land varies with aircraft type, it is possible to specify an approach at glide slope with glide slope flap setting that will cause the proper thrust to be inserted for any aircraft type.

Below are listed the thrust settings and the indicators that must be put on the data sheets to specify them as general rather than specific settings. Underlined letters are the minimum characters needed to specify the setting (e.g., REV will indicate reverse thrust as will REVERSE, but RE will not). The entire entry is acceptable, but not necessary.

Thrust for Reversal	REVERSE
Idle Thrust	IDLE
Thrust for approach flap, Level flight	LEVEL APPROACH
Thrust for approach flap, 3° glide slope	3 DEGREE GLIDE, APPROACH FLAP
Thrust for Landing Flap, 3° glide slope	3 DEGREE GLIDE LANDING FLAP
Thrust for Landing Flap, 6° glide slope	6 DEGREE GLIDE, LANDING FLAP
Thrust for maneuver flap, level flight	LEVEL FLIGHT, MANEUVER FLAP
Thrust for maneuver flap, 500 ft/min. sink	SINKING, MANEUVER FLAP

Although it may not result in an error, the INM program will issue a warning if the distance, altitude, or velocity decreases from one point to the next higher numbered point. This warning is to point out that any such profile is unusual because a landing plane should be getting closer to the runway (both vertically and horizontally) and also reducing speed as it approaches the runway.

3.1.4 Aircraft Traffic Mix Data

The Traffic Mix Data Sheets can be used to record an airport's traffic activity in the manner required by the Integrated Noise Model.

Each sheet can record all arrivals and departures of a single aircraft type on a particular track.

The following information is required for each entry of airport traffic mix data

Aircraft type

Track number

Approach profile number, if any

Number of arrivals per day, evening, and night, if any

Number of departures per day, evening, and night for each stage-length category, if any

After

AIRCRAFT TYPE:

enter either the aircraft name or the aircraft identification number (See Section 3.1.3). If the aircraft type is already part

TRAFFIC MIX DATA SHEET 1

```
AIRCRAFT TYPE: BAC-111
GROUND TRACK NUMBER: 7
APPROACH PROFILE NUMBER: 0
DAILY ARRIVALS                       DAY: 0
                                 EVENING: 0
                                   NIGHT: 0
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO 500             DAY: 3
                                 EVENING: 1
                                   NIGHT: 1
STAGE LENGTH  500 TO 1000            DAY: 2
                                 EVENING: 1.5
                                   NIGHT: -
STAGE LENGTH 1000 TO 1500            DAY:
                                 EVENING:
                                   NIGHT:
STAGE LENGTH 1500 TO 2500            DAY:
                                 EVENING:
                                   NIGHT:
STAGE LENGTH 2500 TO 3500            DAY:
                                 EVENING:
                                   NIGHT:
STAGE LENGTH 3500 TO 4500            DAY:
                                 EVENING:
                                   NIGHT:
STAGE LENGTH 4500 TO 9999            DAY:
                                 EVENING:
                                   NIGHT:

AIRCRAFT TYPE: BAC-111
GROUND TRACK NUMBER: 8
APPROACH PROFILE NUMBER: 0
DAILY ARRIVALS                       DAY: 0
                                 EVENING: 0
                                   NIGHT: 0
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO 500             DAY: 0
                                 EVENING: 0
                                   NIGHT: 0
STAGE LENGTH  500 TO 1000            DAY: 0
                                 EVENING: 0
                                   NIGHT: 0
STAGE LENGTH 1000 TO 1500            DAY: 3
                                 EVENING: 1
                                   NIGHT: 1
STAGE LENGTH 1500 TO 2500            DAY: 2
                                 EVENING: 0
                                   NIGHT: 1.5
STAGE LENGTH 2500 TO 3500            DAY: -
                                 EVENING:
                                   NIGHT:
STAGE LENGTH 3500 TO 4500            DAY:
                                 EVENING:
                                   NIGHT:
STAGE LENGTH 4500 TO 9999            DAY:
                                 EVENING:
                                   NIGHT:
```

```
AIRCRAFT TYPE: BAC-111
GROUND TRACK NUMBER: 9
APPROACH PROFILE NUMBER: 1
DAILY ARRIVALS                      DAY: 9
                                EVENING: 4
                                  NIGHT: 4
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH     0 TO 500          DAY: -
                                EVENING:
                                  NIGHT:
STAGE LENGTH   500 TO 1000         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  1000 TO 1500         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  1500 TO 2500         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  2500 TO 3500         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  3500 TO 4500         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  4500 TO 9999         DAY:
                                EVENING:
                                  NIGHT:

AIRCRAFT TYPE: 727-200
GROUND TRACK NUMBER: 6
APPROACH PROFILE NUMBER: 2
DAILY ARRIVALS                      DAY: 4
                                EVENING: 3
                                  NIGHT: 2
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH     0 TO 500          DAY: 2
                                EVENING: 1
                                  NIGHT: 0
STAGE LENGTH   500 TO 1000         DAY: 2
                                EVENING: 1
                                  NIGHT: 0
STAGE LENGTH  1000 TO 1500         DAY: 2
                                EVENING: 1
                                  NIGHT: -
STAGE LENGTH  1500 TO 2500         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  2500 TO 3500         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  3500 TO 4500         DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH  4500 TO 9999         DAY:
                                EVENING:
                                  NIGHT:
```

TRAFFIC MIX DATA SHEET 3

```
AIRCRAFT TYPE: 707-120B
GROUND TRACK NUMBER: 3
APPROACH PROFILE NUMBER: 1
DAILY ARRIVALS                      DAY: 10
                                EVENING: 2
                                  NIGHT: 5
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO 500            DAY: 5
                                EVENING: 1
                                  NIGHT: 3
STAGE LENGTH  500 TO 1000           DAY: 2
                                EVENING: 0
                                  NIGHT: 1
STAGE LENGTH 1000 TO 1500           DAY: 3
                                EVENING: 0
                                  NIGHT: 1
STAGE LENGTH 1500 TO 2500           DAY: 1
                                EVENING: -
                                  NIGHT:
STAGE LENGTH 2500 TO 3500           DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH 3500 TO 4500           DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH 4500 TO 9999           DAY:
                                EVENING:
                                  NIGHT:

AIRCRAFT TYPE: CESSNA 182
GROUND TRACK NUMBER: 4
APPROACH PROFILE NUMBER: 0
DAILY ARRIVALS                      DAY: 0
                                EVENING: 0
                                  NIGHT: 0
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO 500            DAY: 25
                                EVENING: 5
                                  NIGHT: 10
STAGE LENGTH  500 TO 1000           DAY: -
                                EVENING:
                                  NIGHT:
STAGE LENGTH 1000 TO 1500           DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH 1500 TO 2500           DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH 2500 TO 3500           DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH 3500 TO 4500           DAY:
                                EVENING:
                                  NIGHT:
STAGE LENGTH 4500 TO 9999           DAY:
                                EVENING:
                                  NIGHT:
```

TRAFFIC MIX DATA SHEET 4

AIRCRAFT TYPE: CESSNA 182
GROUND TRACK NUMBER: 2
APPROACH PROFILE NUMBER: 3
DAILY ARRIVALS DAY: 25
EVENING: 5
NIGHT: 10
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH 0 TO 500 DAY: —
EVENING:
NIGHT:
STAGE LENGTH 500 TO 1000 DAY:
EVENING:
NIGHT:
STAGE LENGTH 1000 TO 1500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 1500 TO 2500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 2500 TO 3500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 3500 TO 4500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 4500 TO 9999 DAY:
EVENING:
NIGHT:

AIRCRAFT TYPE:
GROUND TRACK NUMBER:
APPROACH PROFILE NUMBER:
DAILY ARRIVALS DAY:
EVENING:
NIGHT:
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH 0 TO 500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 500 TO 1000 DAY:
EVENING:
NIGHT:
STAGE LENGTH 1000 TO 1500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 1500 TO 2500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 2500 TO 3500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 3500 TO 4500 DAY:
EVENING:
NIGHT:
STAGE LENGTH 4500 TO 9999 DAY:
EVENING:
NIGHT:

of the INM data base, the user can enter its name. If the aircraft type has been defined by the user, its identification number must be used. Aircraft that are already part of the INM data base may be identified by their number if the user wishes.

Entering a zero for the aircraft type, terminates the input of traffic mix data.

After the aircraft type, the user must write the ground track and approach profile identifying numbers. An approach profile is only required if there are arrivals in the entry. These must be the numbers of approach profiles and tracks that were previously entered into the airport data file. Enter after

TRACK NUMBER:

APPROACH PROFILE NUMBER:

The user then enters the average number of daily arrivals, for the aircraft type/track combination for each time period. All three entries are required. An entry of "0" is acceptable.

The number of arrivals for each time period must be between 0 and 99. If the entry will be less than 10, increments of 0.1 are permitted (0.2, 8.4 etc.) in order to average out infrequent arrivals. Enter after

DAILY ARRIVALS DAY:

EVENING:

NIGHT:

Departures

For each stage-length category within the aircraft's range, the user must enter the average number of daily departures for each time period. An entry of "0" is acceptable. If all departures have been entered, the user may terminate departure entries before exhausting all of the possible stage-length categories and go to the next aircraft type, profile and ground track combination. Just write a minus (-) for the next entry. Enter after

STAGE LENGTH 0 TO 500 DAY:
EVENING:
NIGHT:

3.1.5 Optional Aircraft Types Data Sheet

The user may add new aircraft types or modify existing aircraft types. The required data can be entered onto the Aircraft Definition Data Sheets.

On the first sheet only, enter the number of aircraft types to be defined or re-defined, after

HOW MANY?

Each aircraft type is identified by an aircraft type number. For new aircraft types this number must be between 101 and 150, inclusive. Each aircraft type must have its own unique number. To re-define an aircraft that is already part of the INM data base, the new definition must have the same aircraft type number as the aircraft it is replacing.

AIRCRAFT DEFINITION DATA SHEET

HOW MANY? 3

AIRCRAFT TYPE NUMBER: 17

AIRCRAFT NAME: AIRCRAFT X

NOISE CURVE NUMBER: 19

APPROACH PARAMETER NUMBER: 101

FOR EACH TRIP LENGTH RANGE, ENTER A TAKEOFF PROFILE NUMBER

0- 500 MILES: 27

500-1000 MILES: 28

1000-1500 MILES: 29

1500-2500 MILES: 30

2500-3500 MILES: 31

3500-4500 MILES: 32

4500-9999 MILES: 32

COMMENTS:

AIRCRAFT DEFINITION DATA SHEET

HOW MANY?

AIRCRAFT TYPE NUMBER: 101

AIRCRAFT NAME: AIRCRAFT Y

NOISE CURVE NUMBER: 101

APPROACH PARAMETER NUMBER: 102

FOR EACH TRIP LENGTH RANGE, ENTER A TAKEOFF PROFILE NUMBER

0- 500 MILES: 201

500-1000 MILES: 201

1000-1500 MILES: 202

1500-2500 MILES: 202

2500-3500 MILES:

3500-4500 MILES:

4500-9999 MILES:

COMMENTS:

AIRCRAFT DEFINITION DATA SHEET

HOW MANY?

AIRCRAFT TYPE NUMBER: 102

AIRCRAFT NAME: AIRCRAFT Z

NOISE CURVE NUMBER: 20

APPROACH PARAMETER NUMBER: 18

FOR EACH TRIP LENGTH RANGE, ENTER A TAKEOFF PROFILE NUMBER

0- 500 MILES: 38

500-1000 MILES: 28

1000-1500 MILES: 39

1500-2500 MILES: 29

2500-3500 MILES:

3500-4500 MILES:

4500-9999 MILES:

COMMENTS:

This number is entered after

AIRCRAFT TYPE NUMBER.

The number entered will be the identifier of the aircraft for both the INM and Input Module. When asked to identify an aircraft use this number. The aircraft must be entered in order based on their aircraft type numbers.

Each new or changed aircraft type must have an aircraft name. This name can be up to 20 characters long. A name must be provided for each aircraft type defined. Write the name after

AIRCRAFT NAME:

Each aircraft is associated with a noise curve number. This number specifies a set of noise versus slant distance values for the aircraft. The user may enter the number of a noise curve that is part of the INM data base or of a user defined noise curve. The user defined noise curves may be numbered from 101 to 120 inclusive. Be sure to add the appropriate noise curve where required. Enter the number after

NOISE CURVE NUMBER:

Each aircraft type will be associated with a set of approach parameters. These parameters include the landing weight, number of engines, landing roll distance, landing speed and thrust settings under a number of general circumstances. The data is specified elsewhere (Section 3.1.6) and the number of the set of parameters is entered here after

APPROACH PARAMETER NUMBER:

The INM data base contains approach parameters numbered starting with 1, and the user may add new parameters numbered 101 to 150, inclusive.

The rest of the required data is a takeoff profile number for each trip length range which the aircraft can fly. The INM data base includes takeoff profiles numbered starting with 1. The user may add takeoff profiles numbered 201 to 250, inclusive.

It is not necessary to have a takeoff profile for every trip-length range, only for those trip-length ranges that are possible for the aircraft being defined. Make the entries after each range

```
    FOR EACH TRIP LENGTH RANGE, ENTER A TAKEOFF PROFILE
    NUMBER:
                    0 -  500 MILES:
                  500 - 1000 MILES:
                 1000 - 1500 MILES:
                 1500 - 2500 MILES:
                 2500 - 3500 MILES:
                 3500 - 4500 MILES:
                 4500 - 9999 MILES:
```

The user may also enter a comment of up to 30 characters. This is purely for the user's information. It is not used by the INM. This is a good place to briefly explain changes in aircraft that are already part of the INM data base. Put the comment after

```
    COMMENTS:
```

When re-defining aircraft that are already in the INM data base, the user is not required to enter a new value for every property.

The aircraft type number and the aircraft name must be entered in the required form. For any other value, an entry of zero will cause the INM to use the value already in its data base. Only those values which are to be changed need to have an entry other than zero.

This will not work for new aircraft definitions, of course.

NOTE ON LIMITATIONS OF ALTERNATIVE AIRCRAFT DEFINITIONS:

Note that control over directivity parameter data sets for TA (Time above a decibel level) is not provided on the above definition. Directivity parameter sets are retrieved from the data base only for aircraft which use a set of noise vs. distance tables from the data base. Thus, if the user specifies his own noise vs. distance tables for any aircraft, the INM will not calculate values of Time Above. Appendix C contains an example of such a case.

A clear understanding of the contents and arrangement of the data base is essential for the proper use of the aircraft definition. The Data Base Report is provided for that use.

When filling out this section, the user must keep in mind that no more than 99 takeoff profiles, 25 approach parameter data sets, and 24 noise curve tables, either input by the user or retrieved from the data base, may be included in a scenario.

3.1.6 Optional Takeoff Profile Data Sheet

If the user wishes to include takeoff profile data in the airport data, the information should first be entered on Takeoff Profile Data Sheets. Enter one profile on each sheet.

On the first sheet only, write the number of takeoff profiles to be entered after

HOW MANY?

There can be no more than 99 profiles entered here. The following entries are required for every sheet.

After

TAKEOFF PROFILE NUMBER:

enter the profile's identifying number. This must be the number of a takeoff profile to be changed that are already part of the INM data base. User created takeoff profiles must be numbered 201 to 250 inclusive. This number will identify the takeoff profile within the INM Input Module.

Each profile is given a description up to 68 characters long (may contain blanks) after

TAKEOFF PROFILE LABEL:

This label is for the user's convenience in identifying the profile and does not affect the output of the INM.

Distance entries, discussed below, may be in nautical miles or in feet. Select the desired measurement by answering

DO YOU WISH TO ENTER TRACK DISTANCES IN FEET INSTEAD
OF NAUTICAL MILES?

TAKEOFF PROFILE DATA SHEET

HOW MANY? 3

TAKEOFF PROFILE NUMBER: 18

TAKEOFF PROFILE LABEL: REPLACEMENT B727-200 T.O. PROFILE

DO YOU WISH TO ENTER TRACK DISTANCES IN FEET INSTEAD OF NAUTICAL MILES? YES

HOW MANY ENGINES ON AIRCRAFT? 3

TAKEOFF WEIGHT (LBS): 120000

SEGMENT 1 THRUST: 15000

SEGMENT 2 DISTANCE FROM RUNWAY END: 5000
AIR SPEED: 160
THRUST: 15000

SEGMENT 3 DISTANCE FROM RUNWAY END: 25000
HEIGHT ABOVE RUNWAY: 2000
AIR SPEED: 160
THRUST: 15000

SEGMENT 4 DISTANCE FROM RUNWAY END: 50000
HEIGHT ABOVE RUNWAY: 4500
AIR SPEED: 160
THRUST: 15000

SEGMENT 5 DISTANCE FROM RUNWAY END: 75000
HEIGHT ABOVE RUNWAY: 7000
AIR SPEED: 160
THRUST: 15000

SEGMENT 6 DISTANCE FROM RUNWAY END: 100000
HEIGHT ABOVE RUNWAY: 9500
AIR SPEED: 160
THRUST: 15000

SEGMENT 7 DISTANCE FROM RUNWAY END: 150000
HEIGHT ABOVE RUNWAY: 14500
AIR SPEED: 160

TAKEOFF PROFILE DATA SHEET

HOW MANY?

TAKEOFF PROFILE NUMBER: 201

TAKEOFF PROFILE LABEL: AIRCRAFT Y SHORT RANGE T.O. PROFILE

DO YOU WISH TO ENTER TRACK DISTANCES IN FEET INSTEAD OF NAUTICAL MILES? YES

HOW MANY ENGINES ON AIRCRAFT? 3

TAKEOFF WEIGHT (LBS): 300 000

SEGMENT 1 THRUST: 30000

SEGMENT 2 DISTANCE FROM RUNWAY END: 5000
AIR SPEED: 200
THRUST: 30000

SEGMENT 3 DISTANCE FROM RUNWAY END: 25000
HEIGHT ABOVE RUNWAY: 2000
AIR SPEED: 200
THRUST: 30000

SEGMENT 4 DISTANCE FROM RUNWAY END: 50000
HEIGHT ABOVE RUNWAY: 4500
AIR SPEED: 200
THRUST: 30000

SEGMENT 5 DISTANCE FROM RUNWAY END: 75000
HEIGHT ABOVE RUNWAY: 7000
AIR SPEED: 200
THRUST: 30000

SEGMENT 6 DISTANCE FROM RUNWAY END: 100000
HEIGHT ABOVE RUNWAY: 9500
AIR SPEED: 200
THRUST: 30000

SEGMENT 7 DISTANCE FROM RUNWAY END: 150000
HEIGHT ABOVE RUNWAY: 14500
AIR SPEED: 200

TAKEOFF PROFILE DATA SHEET

HOW MANY?

TAKEOFF PROFILE NUMBER: 202

TAKEOFF PROFILE LABEL: AIRCRAFT Y LONG RANGE T.O. PROFILE

DO YOU WISH TO ENTER TRACK DISTANCES IN FEET INSTEAD OF NAUTICAL MILES? YES

HOW MANY ENGINES ON AIRCRAFT? 3

TAKEOFF WEIGHT (LBS): 350000

SEGMENT 1 THRUST: 30000

SEGMENT 2 DISTANCE FROM RUNWAY END: 10000
AIR SPEED: 250
THRUST: 30000

SEGMENT 3 DISTANCE FROM RUNWAY END: 20000
HEIGHT ABOVE RUNWAY: 2000
AIR SPEED: 250
THRUST: 30000

SEGMENT 4 DISTANCE FROM RUNWAY END: 50000
HEIGHT ABOVE RUNWAY: 4000
AIR SPEED: 250
THRUST: 30000

SEGMENT 5 DISTANCE FROM RUNWAY END: 70000
HEIGHT ABOVE RUNWAY: 6000
AIR SPEED: 250
THRUST: 30000

SEGMENT 6 DISTANCE FROM RUNWAY END: 100000
HEIGHT ABOVE RUNWAY: 9000
AIR SPEED: 250
THRUST: 30000

SEGMENT 7 DISTANCE FROM RUNWAY END: 150000
HEIGHT ABOVE RUNWAY: 14000
AIR SPEED: 250

The answer should be YES or NO.

The number of engines on aircraft using the profile must be entered after

HOW MANY ENGINES ON AIRCRAFT?

The aircraft's takeoff weight, in pounds, must be entered after

TAKEOFF WEIGHT (LBS):

Each segment is defined by up to four entries.

Each takeoff profile consists of 7 segments.

1) The distance of the point (along the runway or track) from the point where the takeoff run starts. This distance may be in nautical miles or feet depending on the option chosen by the user. The first segment does not require any distance entry. Enter after

DISTANCE FROM RUNWAY END:

2) The height of the aircraft, at the start of the segment, in feet above the runway. No entry is required for the first segment. Enter after

HEIGHT ABOVE RUNWAY:

3) The speed of the aircraft in knots as it crosses the point being described. No entry is required for the first point. Enter after

AIR SPEED:

4) The thrust of the aircraft in pounds per engine. Each

thrust entry is applied to the segment connecting the point specified to the next higher numbered point. The thrust specified for segment 2 applies from the beginning of segment 2 to the beginning of segment 3. No thrust entry is required for the last segment. Enter after

THRUST:

Spaces on the data sheet are provided for the required entries. The approach profiles allow the user to specify indicators for some segment entries. This is not possible for takeoff profiles.

Although it may not result in an error, the INM program will issue a warning if the distance, altitude, or velocity decreases from segment to higher numbered segment. This warning is to point out that any such profile is unusual because a plane taking off should be getting further from the runway (both horizontally and vertically) and increasing its speed.

3.1.7 Optional Approach Parameter Data Sheet

A number of parameters for each aircraft type are required for use in calculating the noise caused by the aircraft type during its approach. Optional approach parameters must be created for newly defined aircraft types. The user may also redefine the approach parameter data for aircraft that are already included in the INM data base.

The approach parameter values should be recorded on Approach Parameter Data Sheets, using one sheet for each set of parameters.

APPROACH PARAMETER DATA SHEET

HOW MANY? 2

APPROACH PARAMETER NUMBER: 101

AIRCRAFT NAME: ACFT X

LANDING WEIGHT (LBS): 100000

NUMBER OF ENGINES: 4

LANDING ROLL DISTANCE (FEET): 5000

LANDING SPEED (KNOTS): 150

THRUST FOR 3DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG): 10000

THRUST FOR 6DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):

THRUST FOR LEVEL FLIGHT WITH APPROACH FLAPS (LBS/ENG):

THRUST FOR 3DEG GLIDE SLOPE WITH APPROACH FLAPS (LBS/ENG): 10000

THRUST FOR LEVEL FLIGHT WITH MANEUVER FLAPS (LBS/ENG):

THRUST FOR 500 FT/NM DESCENT WITH MANEUBER FLAPS (LBS/ENG):

THRUST FOR IDLE (LBS/ENG):

THRUST FOR REVERSAL (LBS/ENG): 15000

APPROACH PARAMETER DATA SHEET

HOW MANY?

APPROACH PARAMETER NUMBER: 102

AIRCRAFT NAME: ACFT Y

LANDING WEIGHT (LBS): 200000

NUMBER OF ENGINES: 3

LANDING ROLL DISTANCE (FEET): 3000

LANDING SPEED (KNOTS): 180

THRUST FOR 3DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG): 15000

THRUST FOR 6DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG): 8000

THRUST FOR LEVEL FLIGHT WITH APPROACH FLAPS (LBS/ENG): 10000

THRUST FOR 3DEG GLIDE SLOPE WITH APPROACH FLAPS (LBS/ENG): 12000

THRUST FOR LEVEL FLIGHT WITH MANEUVER FLAPS (LBS/ENG): 7000

THRUST FOR 500 FT/NM DESCENT WITH MANEUBER FLAPS (LBS/ENG): 7500

THRUST FOR IDLE (LBS/ENG): 4000

THRUST FOR REVERSAL (LBS/ENG): 20000

Enter the number of approach parameters being entered on the first sheet only, after

HOW MANY?

Each parameter is identified by a number which is entered after

APPROACH PARAMETER NUMBER:

If the user is altering an approach parameter that is already part of the INM data base, its number must be entered. If the user is adding a new set of approach parameters it must have a number between 101 and 150, inclusive. Be sure that the approach parameter number matches the approach parameter number of the aircraft type definition it is meant for (i.e., in the sample airport case, aircraft "Y" has an approach parameter value of 102 in its definition. Approach parameter 102 must refer to aircraft "Y").

Next the user enters the aircraft name after

AIRCRAFT NAME:

This name may be 12 characters long. It is not necessary that it match, exactly, the name in the aircraft definition data. It is used only to help the user in reading the data base.

After this the user enters the actual approach parameters

LANDING WEIGHT (LBS):

Enter the aircraft's landing weight in pounds.

NUMBER OF ENGINES:

Enter the number of engines the aircraft has.

LANDING ROLL DISTANCE (FEET):

Enter the distance that the aircraft travels from the touchdown point to the point where the airplane stops.

LANDING SPEED (KNOTS):

Enter the aircraft's maximum safe landing speed in knots.

The next eight entries are thrust settings in pounds of thrust per engine. The description of each thrust setting is the state of the aircraft which the thrust setting is required to maintain. Enter the appropriate thrust setting after its label.

The labels are

THRUST FOR 3 DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):

THRUST FOR 6 DEG SLOPE WITH LANDING FLAPS (LBS/ENG):

THRUST FOR LEVEL FLIGHT WITH APPROACH FLAPS (LBS/ENG):

THRUST FOR 3 DEG GLIDE SLOPE WITH APPROACH FLAPS (LBS/ENG):

THRUST FOR 500 FT/NMI DESCENT WITH MANEUVER FLAPS (LBS/ENG):

THRUST FOR IDLE (LBS/ENG):

THRUST FOR REVERSAL (LBS/ENG):

An entry of zero indicates that the particular approach state is not applicable to that aircraft.

3.1.8 Optional Noise Curve Data Sheet

The user may add new noise curves. The required data can be entered onto the Noise Curve Data Sheets.

On the first sheet only, enter the number of noise curves to added from

HOW MANY?

Each noise curve is identified by a number. User created noise curves must be numbered 101 to 120, inclusive.

The number is entered after

NOISE CURVE IDENTIFICATION NUMBER:

The next entry is a label for the noise curve. This is for the user's information and may be up to 30 characters long. Enter it after

NOISE CURVE NAME:

Each noise curve consists of noise levels at a number of distances for various engine thrust settings. There must be at least 2 thrust settings and no more than 6 thrust settings. The settings must be entered in order of decreasing thrust. Enter the number of thrust settings after

NUMBER OF THRUST VALUES:

The thrust setting value is entered after

CORRECTED NET THRUST (LBS/ENG):

For each thrust setting, the user must enter the EPNL and NEL in decibels at 8 distances, as shown here

NOISE CURVE DATA SHEET

HOW MANY? 1

NOISE CURVE IDENTIFICATION NUMBER: 101

NOISE CURVE TITLE: TABLES FOR AIRCRAFT Y

NUMBER OF THRUST VALUES: 3

CORRECTED NET THRUST (LBS/ENG): 30000

EPNL AT 200 FT (dB): 105 NEL AT 200 FT (dB): 100

EPNL AT 400 FT (dB): 100 NEL AT 400 FT (dB): 95

EPNL AT 600 FT (dB): 95 NEL AT 600 FT (dB): 90

EPNL AT 1000 FT (dB): 90 NEL AT 1000 FT (dB): 85

EPNL AT 2000 FT (dB): 85 NEL AT 2000 FT (dB): 80

EPNL AT 4000 FT (dB): 80 NEL AT 4000 FT (dB): 75

EPNL AT 6000 FT (dB): 75 NEL AT 6000 FT (dB): 70

EPNL AT 10000 FT (dB): 70 NEL AT 10000 FT (dB): 65

CORRECTED NET THRUST (LBS/ENG): 20000

EPNL AT 200 FT (dB): 100 NEL AT 200 FT (dB): 95

EPNL AT 400 FT (dB): 95 NEL AT 400 FT (dB): 90

EPNL AT 600 FT (dB): 90 NEL AT 600 FT (dB): 85

EPNL AT 1000 FT (dB): 85 NEL AT 1000 FT (dB): 80

EPNL AT 2000 FT (dB): 80 NEL AT 2000 FT (dB): 75

EPNL AT 4000 FT (dB): 75 NEL AT 4000 FT (dB): 70

EPNL AT 6000 FT (dB): 70 NEL AT 6000 FT (dB): 65

EPNL AT 10000 FT (dB): 65 NEL AT 10000 FT (dB): 60

CORRECTED NET THRUST (LBS/ENG): 10000

EPNL AT 200 FT (dB): 95 NEL AT 200 FT (dB): 90

EPNL AT 400 FT (dB): 90 NEL AT 400 FT (dB): 85

EPNL AT 600 FT (dB): 85 NEL AT 600 FT (dB): 80

EPNL AT 1000 FT (dB): 80 NEL AT 1000 FT (dB): 75

EPNL AT 2000 FT (dB): 75 NEL AT 2000 FT (dB): 70

EPNL AT 4000 FT (dB): 70 NEL AT 4000 FT (dB): 65

EPNL AT 6000 FT (dB): 65 NEL AT 6000 FT (dB): 60

EPNL AT 10000 FT (dB): 60 NEL AT 10000 FT (dB): 55

EPNL AT	200 FT (dB):	NEL AT	200 FT (dB):
EPNL AT	400 FT (dB):	NEL AT	400 FT (dB):
EPNL AT	600 FT (dB):	NEL AT	600 FT (dB):
EPNL AT	1000 FT (dB):	NEL AT	1000 FT (dB):
EPNL AT	2000 FT (dB):	NEL AT	2000 FT (dB):
EPNL AT	4000 FT (dB):	NEL AT	4000 FT (dB):
EPNL AT	6000 FT (dB):	NEL AT	6000 FT (dB):
EPNL AT	10000 FT (dB):	NEL AT	10000 FT (dB):

A value for both EPNL and NEL must be entered for every distance. For noise curves containing more than 2 thrust settings, data continuation sheets must be used. Be sure to label the sheet with the noise curve identification number.

3.1.9 Optional Takeoff Modifications Data Sheet

The user may modify takeoff profiles that are part of the INM data base without completely replacing them. The data on these modifications is entered on the Takeoff Modification Data Sheet.

The first entry on the sheet is for overrides of the modifications to follow. The overrides are based on the data base noise curve identification numbers. There are 4 possible override conditions:

0 - accept any takeoff modification

1 - do not accept any modification

2 - accept engine-out (type 4) cutback only

3 - accept takeoff power or climb power (types 2 and 3) modifications only.

Unless specified here, the override will be "0" (i.e., no modification will be overridden). To change this, the user should enter the noise curve number with the desired override below it in the blocks following.

NOISE CURVE NUMBER:

OVERRIDE TYPE:

After this, the modifications data can be entered on the sheets. Up to 25 modifications can be added. The first two go on the Takeoff Modification Data Sheet. Any further restrictions should be written on the continuation sheets provided.

The modifications are numbered based on their order of entry. The first entered is number 1, the second is number 2, etc.

For each modification, the first entry is the type number. This must be an integer from 0 to 5. (See Section 2.3.5.) If a "0" is entered, take off restriction entry ends. Enter after

MODIFICATION 1 TYPE:

Only if the restriction type is 5 (specified climb gradient) an entry must be made after

GRADIENT:

All restriction types require a starting distance in nautical miles or a starting altitude in feet and an ending distance or altitude. If the entry is greater than 100, it indicates altitude

MODIFICATION DATA SHEET

RESTRICTION OVERRIDES

NOISE CURVE NUMBER	11																			
OVERRIDE TYPE	1																			

NOISE CURVE NUMBER																				
OVERRIDE TYPE																				

HOW MANY MODIFICATIONS? 2

RESTRICTION 1 TYPE: 1

GRADIENT:

START: 3000

END: 10

AFFECTED TRACK: 3 AFFECTED TRACK:

AFFECTED TRACK: AFFECTED TRACK:

AFFECTED TRACK: AFFECTED TRACK:

AFFECTED TRACK: AFFECTED TRACK:

AFFECTED TRACK: AFFECTED TRACK:

RESTRICTION 2 TYPE: 5

GRADIENT: .04

START: 3

END: 8000

AFFECTED TRACK: 7 AFFECTED TRACK:

AFFECTED TRACK: 8 AFFECTED TRACK:

AFFECTED TRACK: AFFECTED TRACK:

AFFECTED TRACK: AFFECTED TRACK:

AFFECTED TRACK: AFFECTED TRACK:

in feet. If the entry is less than 100, it is nautical miles from start of takeoff roll. Make the entries after

START:

END:

The next entries are the tracks affected by the restriction. Each entry must be the identifier for a track which is actually in the airport data. Entering a zero "0" ends input of affected track numbers. This input ends automatically after 10 tracks have been entered. Enter after

AFFECTED TRACK:

3.2 OUTPUT SPECIFICATIONS

Section 3.1 describes the input case data preparation. Section 3.2 describes the output specifications for presenting the INM calculations for the input case. There are two types of outputs available. The GRID output produces a printout of noise values at specified points on the grid around the airport area. The CONTOUR output produces data for plotting a contour map of specified noise levels in the airport area (See Section 6 for further description).

3.2.1 Grid Output Specifications

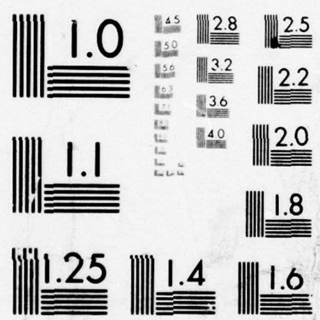
Specifications for output of noise values based on the points of a grid should be written on a Grid Output Data Sheet.

The first entry is the identifying name of the file which

AD-A079 493 FEDERAL AVIATION ADMINISTRATION WASHINGTON DC OFFICE --ETC F/G 1/2
INTEGRATED NOISE MODEL (INM). VERSION 2. USER'S GUIDE,(U)
SEP 79 T CONNOR, R HINCKLEY

UNCLASSIFIED FAA-AEE-79-09 NL

2 OF 5
AD
A079493



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

X

contains the airport and operations data for the case. This file must have been previously created by the user. The second entry is the name of the file to be created by combining the airport data file with the grid output specifications. This file is referred to as the "run-time file" elsewhere. These file names should be written after

AIRPORT DATA FILE NAME:

RUN-TIME FILE NAME:

The next entry is the title which will appear on every page of the output. It may be up to 80 characters long. If it is not that long, the program will center it for you. Enter the title after

TITLE FOR OUTPUT:

The user may have more than one different grid output at a time. Just keep adding actual grid specifications. These are the data to be entered below.

The actual grid is defined by three entries: 1. Entering the coordinates of one point using the same coordinate system as was used to define the runways for the airport data file being used. The coordinates will be expressed in feet; 2. Entering the increment (distance) between points in each dimension (X and Y) expressed in feet; 3. Entering the number of values along the

grid in the X- and Y- directions. The actual number of points in the grid is the product of the number of X-values times the number of Y-values.

If the grid is considered as a rectangle with corners indicated by points and filled with a regular array of points, it will appear as in Figure 3.2-1.

The starting X- and Y-coordinates define one corner of the rectangle. They should be entered after

STARTING X-COORDINATE:

STARTING Y-COORDINATE:

The X-increment is the distance to the next point moving parallel to the X-axis. The Y-increment is the distance to the next point along the Y-axis. Enter after

X-INCREMENT:

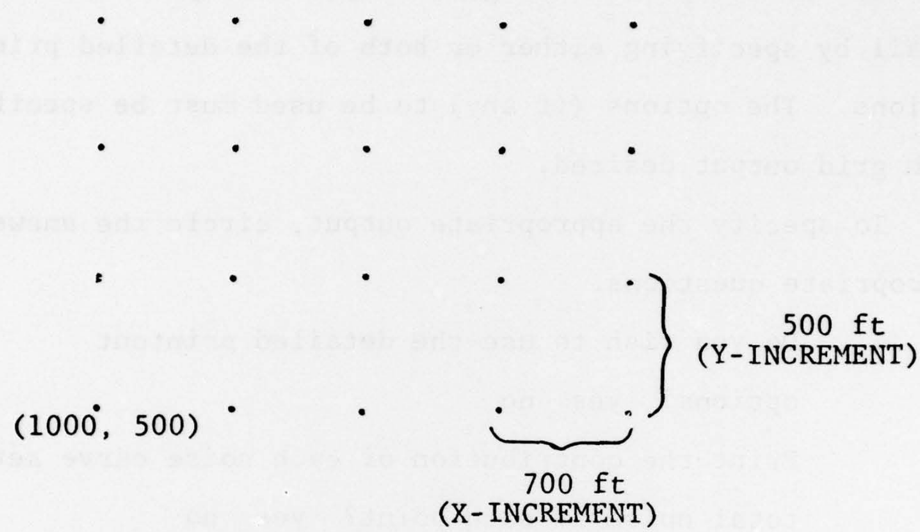
Y-INCREMENT:

The number of X-values and Y-values gives the rest of the information required to define the grid. Enter after

NUMBER OF X-VALUES:

NUMBER OF Y-VALUES:

It is possible for the grid output to consist of a single point by using "1" as the number of both the X- and Y-values. Points along one line (parallel to one axis) can form the grid by having either one X-value or one Y-value.



STARTING X-COORDINATE:	1000
STARTING Y-COORDINATE:	500
X-INCREMENT:	700
Y-INCREMENT:	500
NUMBER OF X VALUES:	5
NUMBER OF Y VALUES:	4

FIGURE 3.2-1. SCHEMATIC OF THE GRID

The user may have the grid output data presented in more detail by specifying either or both of the detailed printout options. The options (if any) to be used must be specified for each grid output desired.

To specify the appropriate output, circle the answers to the appropriate questions.

> Do you wish to use the detailed printout options? yes no
>
> Print the contribution of each noise curve set to the total noise at each point? yes no
>
> Print detailed information for each flight at each point? yes no

For an explanation of each possible type of output, see the section on output data, Appendix 5.

If more than one grid output is specified, be sure to

> Number the second and subsequent pages.
>
> Do not enter more file names or titles.
>
> Specify the desired detailed output for every grid.

3.2.2 Contour Output Specifications

Selecting contour output will generate data for plotting contours of the selected values of the metric in the area around the airport. For example, if the metric is NEF (Noise Exposure Forecast) and the contour value is 30 dB, the area enclosed by the

curve will have a NEF at or above 30dB.

The first entry on the data form is for the name, or other identifier, of the airport data file to be used. The second entry is for the name of the run-time file being created. This will consist of the airport data plus the contour specifications. Enter these after

AIRPORT DATA FILE NAME:

RUN-TIME FILE NAME:

The third entry is for a title which will appear on every page of the output. The title may be up to 80 characters long. It will be centered on the output, no matter what its length. Enter after

OUTPUT TITLE:

A single metric (see Section 5) must be selected for the entire output. There are four noise exposure metrics:

NEF - Noise Exposure Forecast - a weighted summation of noise energy over a 24 hour period (weighted for the time of day). It is a measure of the relative noise impact of aircraft near an airport.

LEQ - Equivalent Sound Level - average noise level integrated over some specified period of time. It provides a single number measure of time-varying noise for a predetermined time period.

CONTOUR SPECIFICATION ENTRY FORM

AIRPORT DATA FILE NAME: EXAMPL.DAT

RUN-TIME FILE NAME: EXAMPL.RUN

OUTPUT TITLE: EXAMPLE AIRPORT SCENARIO

METRIC: NEF

CONTOUR VALUE: 30

OPTIONAL VALUES

TOLERANCE:

STARTING X-COORDINATE:

STARTING Y-COORDINATE:

MAXIMUM STEP SIZE:

STOPPING X-COORDINATE:

STOPPING Y-COORDINATE:

MAXIMUM NUMBER OF CONTOUR POINTS:

CONTOUR SPECIFICATION ENTRY FORM

AIRPORT DATA FILE NAME:

RUN-TIME FILE NAME:

OUTPUT TITLE:

METRIC:

CONTOUR VALUE: 40

OPTIONAL VALUES

TOLERANCE:

STARTING X-COORDINATE:

STARTING Y-COORDINATE:

MAXIMUM STEP SIZE:

STOPPING X-COORDINATE:

STOPPING Y-COORDINATE:

MAXIMUM NUMBER OF CONTOUR POINTS:

LDN - Day-Night Average Sound Level - average A-weighted noise level integrated over a 24-hour period. Appropriate weightings are applied for the noise levels occurring in the daytime and nighttime periods.

CNEL - Community Noise Equivalent Level - average A-weighted noise level measured for a 24-hour period with different weighting factors for noise levels occurring during the day, evening, and night.

Write one of the following abbreviations for the metric:

after Metric:

NEF - Noise Exposure Forecast

LDN - Day-night Equivalent Sound Level

CNEL - Community Noise Equivalent Level

LEQ - Equivalent Sound Value

For each contour line desired, contour specifications are required. Only one specification is essential.

The value of the metric on the contour must be entered after

CONTOUR VALUE:

It is not necessary to enter any other contour specifications, but the user may do so. The following values will make the contour calculations more or less precise and, if carefully employed, may save computing time.

The contour value tolerance is the acceptable deviation from

the contour value which will permit the program to accept a point as being on the contour. The default value is 0.1 units. If a point that is being checked has a value of 64.92 dB and the contour value is 65 dB the point would be considered to be on the contour. If the point's value was 64.87, it would be rejected as not on the contour line. The user may change this to any desired tolerance. However, a very small tolerance value will greatly increase the cost of computing the contour. A very large tolerance will result in an inaccurate contour. Enter after

TOLERANCE:

The starting X-coordinate and Y-coordinate, if entered, tell the program where to start looking for the first point on the contour. If the user has a good idea of where such a point is located, some computing time can be saved by entering this first point. Use the coordinate system specified to locate runways and to allow the INM to determine on its own, the location of the first point on the contour. If the user chooses the option of having the program find the first point on its own, the model will choose the most heavily-used takeoff runway and compute noise values on a line coincident with the runway centerline until the contour value is found or is straddled by two successive noise levels. The most heavily-used takeoff runway is identified as

the default runway on the output. Enter after

STARTING X-COORDINATE:

STARTING Y-COORDINATE:

Maximum Step Size, specifies the distance between points on the contour. If no value is entered, the INM will calculate a value based on the contour value and the number of aircraft operations. Enter after

MAXIMUM STEP SIZE:

If the user knows exactly where the contour will end, the coordinates should be entered after

STOPPING X-COORDINATE:

STOPPING Y-COORDINATE:

Maximum number of contour points will specify how many points on the contour will be calculated before the maximum number has been reached. The calculations will stop if the last point calculated is not within a distance which is 5 step sizes from the starting point. If it is that close the calculations will continue. The default value is 250 points, and the maximum number is 650 points. Enter after

MAXIMUM NUMBER OF CONTOUR POINTS:

When a new case has been created the user may wish to test it for errors before making an expensive computer run to obtain contour output. An easy way to do this is to specify a maximum number of Contour Points of 2. Run the case and correct any errors

found. When the case is satisfactory, re-enter the output specifications without this limit. A considerable amount of time and money can be saved this way because an unsuccessful attempt at a contour plot can prove very expensive.

The user may specify more than one contour in the run-time file. Fill out a set of specifications (threshold value, contour value, etc.) for each contour desired. The user should not specify any of the optional values unless the effect on the output is fully understood.

4.0 ENTERING INM DATA AT THE TERMINAL

Sections 2 and 3 have described the preparation of INM input data onto data sheets. Section 4 describes the entry of the input case from a terminal into the INM. The process is quite straightforward since the INM Input Module automatically displays questions (and instructions) at the terminal in identical format to those on the input data sheets. The user enters the response to the question from the data sheet. (Note that the order of sequence in Section 4 is the one required by INM and differs somewhat from the order of Section 2 and 3.) Little or no computer or programming skills are required for terminal entry. Experienced users may skip over this section. One user-oriented feature of the INM Input Module is that every few lines of input code are automatically saved in the event of computer communication problems. Thus a user could lose only a few lines of entry. Another user feature is the display and edit to insure that correct data has been entered.

When the coding sheets for creating an airport data file, entering run-time specifications, or editing a previously created file have been completed, it is necessary to enter the data into the Input Module program from a terminal during an interactive session.

If the coding sheets have been properly filled out, nothing

more is required than typing the entries, as written, after the appropriate prompting by the Input Module. In many cases, errors will be pointed out by the Module and the user will be asked to retype the entry. However, it is easier to pay careful attention while making the entry in the first place.

Following general instructions for using the interactive Input Module, there are detailed explanations of the limits on permissible entries, the lengths of entries (in characters) and ranges of possible entries. Refer to the appropriate sections as needed or if uncertainty develops. It is not expected that the user will refer to these sections frequently; the detailed explanations are to help the user understand possible errors.

After every few entries, the user will be asked to review and correct (if necessary) the previous entries. Mistakes which are not caught at this point will have to be corrected using the edit mode of the Input Module. (See Section 7.)

4.1 USING THE INTERACTIVE MODULE

Preparing a case for the INM is facilitated by using the INM Input Module. The person using the interactive module does not have to be a specialist, but will only have to know a few standard techniques, namely, how to log onto the computer, how to run a program, how to list the airport case data files, how to destroy unwanted data files, and how to change the name of a data file.

These are described in this chapter.

Prompted by the proper starting command, the program will begin asking the same questions as on the data sheets which the user will answer by using the keyboard and the data recorded on work sheets.

Listing data files means keeping a complete log or listing, by name, of each file and how it differs from other data files. This is important because in creating or modifying the data files the user will probably accumulate a number of them. A list of the files the user has created can be called up at any time by the proper command but you need to know more than just the names of the files.

Destroy unwanted files: When a file is no longer needed, most probably after running a case, it should be destroyed.

Changing the name of a data file will sometimes be necessary to replace a file with a new or revised one. The new or revised file will have a unique name. The old file can be replaced with the new file by erasing the old file and changing the temporary name of the new file to the name of the old file. If the old file was named AIRONE and the new file was named AIRTWO, the user would erase AIRONE and then rename AIRTWO as AIRONE.

Note that the actual commands used to perform the foregoing functions will depend upon the particular computer being used.

The INM Input Module has 4 major functions:

CREATE an airport data file - the user creates a data file using entries on data sheets and the Input Module.

OUTPUT CONTROL commands are added to an airport data file to create a run-time file.

EDIT a previously created airport data file to change or expand it. Plot data created by running the INM.

This INM Input Module code is in ANSII standard FORTRAN '66. As such it has no provisions for opening and closing named files. The input module uses no more than two files at once:

An input file given logical device number 22

An output file given logical device number 21.

Since a number of files may be created and edited for any one project it is best to give each file a meaningful name and keep a record of files available and their origin and their contents.

If the system in use does not provide for naming and accessing named files from within a FORTRAN program, the appropriate files must be assigned the correct logical unit number before running the Input Module. Discuss this with your computer support personnel.

If the available system's version of FORTRAN can name files and assign them logical device numbers, simple additions to the subroutines CREATE, EDIT, CONPLT, AND CONTROL will add this capability.

4.2 USING THE CREATE FUNCTION OF THE INPUT MODULE

The user may choose the CREATE function with any entry starting with 'CR' after

ENTER THE ACTION YOU WISH TO PERFORM: (CREATE, for example).

This will allow the user to enter all the sections of data that make up an airport case study. There may be up to 9 sections:

Runways (including airport altitude and temperature)

Tracks

Alternative Aircraft Definitions (optional)

Alternative Takeoff Profiles (optional)

Approach Profiles

Alternative Approach Parameters (optional)

Alternative Noise Curve Data (optional)

Traffic Mix Data

Takeoff Modifications (optional)

A detailed description is given below of the acceptable inputs for each query for each section. The user should be able to just enter the data as written on the data sheet in response to the queries. Refer to the detailed explanations only if some difficulty occurs. Remember to hit the RETURN key after each entry. The data used are from Example 2.

4.2.1 Entering Runway Data

The first query will be:

WHAT IS THE AIRPORTS ALTITUDE IN FEET ABOVE SEA LEVEL?

The response must be a number no more than 9 digits long (not counting an optional decimal point).

The next query will be

WHAT IS THE AVERAGE AMBIENT TEMPERATURE IN DEGREES CELSIUS?

The reponse must be a number no more than 9 digits long (not counting an optional decimal point).

The program will then display

ALTITUDE: 0. TEMPERATURE: 15.

ARE THE ENTRIES CORRECT (Y/N)?

Any response starting with a "Y" (i.e., YES) will result in the data being accepted as entered. Any other response will result in the program asking the user to reenter the altitude and temperature data as entered above.

The next query is

HOW MANY RUNWAYS ARE THERE?

The answer must be an integer between 1 and 15, inclusive. For each runway the user must make the following entries. The coordinates of the runway are entered in response to:

```
RUNWAY NUMBER 1
START:      X =
            Y =
END         X =
            Y =
```

Each response must be a number up to 7 digits long (counting an optional minus sign, not counting an optional decimal point).

An exception is that the starting X-coordinate of any runway (except #1) may be any character string starting with "R". In this case, no entry is made for the other coordinates. The runway (runway 4 would be the reverse of runway 3) is entered as the reverse of the previous runway. The starting coordinates of the previous runway become the ending coordinates of the current runway. The end coordinates of the previous runway become the start coordinates of the current runway.

The two-part runway name is entered after

RUNWAY NAME TAKEOFF:
            LANDING:

Every runway, unless "R" is entered for the coordinates, must be given a unique two part name. Each part may be up to 3 characters long.

The last entry for each runway is in response to

COMMENTS:

This entry may be up to 17 characters long (if there is any entry at all).

After every 5 runways entered and when all the runways have been entered, they will be displayed and the user will be queried.

RWY	X-START	Y-START	X-END	Y-END	NAME	COMMENTS
1	10000.	0.	0.	0.	27 9	T. O. RWY 27
2	0.	0.	10000.	0.	9 27	T. O. RWY 9
3	7000.	-7000.	2000.	2000.	31 13	T. O. RWY 31
4	2000.	2000.	7000.	-7000.	13 31	T. O. RWY 13

ENTER NUMBER OF ANY INCORRECT RUNWAY, ENTER 0 IF ALL ARE CORRECT:

The response must be an integer from 0 to 15. If a 0 is entered, the runways will be copied, to the airport data file and the program will continue.

If the number is any runway in the group displayed, the user will be asked to replace it and then asked to approve or correct the entries.

The user may add more runways than originally intended, when all the runways have been entered, and the program asks the user to approve or correct the last group, enter the number of the runway to be added. The program will then ask the user to enter the runway.

The user may continue to add runways in this fashion up to a total of 15 runways.

4.2.2 Entering Track Data

The first query of the track section will be:

HOW MANY TRACKS ARE THERE?

The number of tracks must be an integer from 1 to 88.

The following entries are required for each ground track.

After

WHICH RUNWAY (USE THE NUMBER) DOES TRACK 1 START ON?

enter a runway number. This is the runway associated with the track. The entry must be an integer from 1 to 15.

The next entry, in response to the query:

HOW MANY SEGMENTS ARE ON THE TRACK?

must be an integer from 1 to 15. An entry of 2 is not acceptable.

The entries required for each segment depend on the segment number and type. The first and last segments must be straight line segments and only their length is entered. The length is expressed in nautical miles and is entered as a number up to 4 characters long, not counting an optional decimal point.

LENGTH OF SEGMENT 1 IN NAUTICAL MILES:
4.937

Most other segments require an entry to specify whether the segment is straight or curved. Any entry starting with "S" (or "S" alone) indicates a straight segment. Any entry starting with "C" (or "C" alone) indicates a curved segment. After entering a straight segment, the next segment does not have to be so specified because it must be curved.

IS SEGMENT 3 STRAIGHT OR CURVED?

S

LENGTH OF SEGMENT 3 IN NAUTICAL MILES:
1.975

Curved ground track segments require two entries, a turn angle and a turn radius. The turn angle is entered, in degrees, as a number up to 4 characters long, not counting an optional decimal point. The turn must be greater than 0 and not greater than 270 degrees. The radius of the turn is entered in nautical miles. It must be a number up to 4 characters long (including an optional minus sign but not counting an optional decimal point). The sign of the radius indicates the direction of the turn in which a positive radius indicates a clockwise turn and a negative, a counter clockwise turn, moving along the track away from the runway.

```
SEGMENT 4 TURN ANGLE IN DEGREES:
45

RADIUS OF TURN IN NAUTICAL MILES:
-1.5
```

No more than two curved segments may occur in succession.

After every 5 track entries, and after the last entry, the user will be asked to examine, correct, and approve the entries. When correct they will be copied to the airport data file.

RW	TK	SG	DT1	DT2	RD2	DT3	RD3	DT4	RD4	DT5	RD5	DT6	RD6	DT7	RD7	DT8
1	1	1	50.													
1	2	3	.5	45.	1.5	50.										
3	3	1	50.													
2	4	5	.5	90.	-1.5	1.5	0.	45.	-1.5	50.						
2	5	1	50.													

ENTER THE NUMBER OF ANY INCORRECT TRACK, ENTER 0 IF TRACKS ARE CORRECT:

If the entry is the number of one of the tracks in the group, the user will be asked to enter the track's definition again, as described above.

If the entry does not match a track in the group, the user will be asked to make the entry over again unless the last group is being checked so that as many tracks as desired may be added.

If the number is greater than that of any track in the group, the user will be allowed to add another track. This may be repeated.

If, when adding tracks, the current group is filled and the user tries to add another track, the message:

APPROVE ENTERED TRACKS MORE WILL BE ADDED

will appear. When the current group has been approved, the user will be asked to add another track.

4.2.3 Entering Optional Alternative Aircraft Definition

Optional alternative aircraft definition data will have been entered on a data sheet. When the Input Module reaches the alternative aircraft section it will ask:

DO YOU WISH TO ADD OR CHANGE AIRCRAFT DEFINITIONS (Y/N)?

Any response starting with a "Y" (i.e., YES) will result in the user being able to add aircraft definitions. Any other response will result in the Input Module going on to the Optional Takeoff Profile section.

The next question will be:

HOW MANY:

The response must be an integer between 0 and 30, inclusive.

The user will then be asked to add each alternative aircraft definition. After every 5 entries, the user will be asked to examine, correct, and approve the entries. When correct they will be copied to the airport data file.

Each aircraft definition will require the following entries:

AIRCRAFT TYPE NUMBER:

The response must be an integer between 1 and the number of aircraft types in the INM data base or 101 and 150, inclusive.

AIRCRAFT NAME:

It may be up to 20 characters long and may contain numbers, letters, punctuation, and spaces.

NOISE CURVE NUMBER:

This must be an integer between 1 and the number of INM noise curves or 101 and 120, inclusive.

APPROACH PARAMETER NUMBER:

It must be an integer between 1 and the number of INM approach parameters or 101 and 150, inclusive.

There will be a variable number of entires following:

FOR EACH TRIP LENGTH RANGE ENTER A TAKEOFF PROFILE
NUMBER, ENTER - 1 WHEN DONE:

After each trip length range (i.e., 0-500 miles:), enter an integer between -1 and the number of INM takeoff profiles or 201

and 250, inclusive. If "-1" is entered, the Input Module will stop accepting entries and go on to the comments. A "-1" should be entered if all the rest of the entries are "0" or blank.

COMMENTS:

This entry may be up to 30 characters long.

After 5 entries and when finished, the Input Module will display the last set of entries and ask the user to check them:

#	NAME	NOISE CURVE	APPR PROF	TAKEOFF PROFILES FOR TRIP LENGTHS 1	2	3	4	5	6	7
17	AIRCRAFT X	19	101	27	28	29	30	31	32	32

ENTER THE NUMBER OF ANY INCORRECT AIRCRAFT ENTER 0 IF ALL ARE CORRECT:

An entry of "0" will result in the displayed entries being copied to the airport data file.

If the entry matches one of the aircraft type numbers in the group, the user will be asked to re-enter that aircraft's definition.

If the entry does not match any of the group's aircraft type numbers, the user will be asked to re-enter the number unless the last group is being checked.

The user may add aircraft beyond the number entered after "HOW MANY?" above. When all of the other aircraft have been added, and the last group is being checked, enter the number of the aircraft type to be added. The program will respond:

DO YOU WISH TO ADD THIS AIRCRAFT TYPE (Y/N)?

Any response starting with a "Y" (i.e., YES) will result in

the program asking for the entire aircraft definition (including re-entering the aircraft type number).

Any response starting with an "N" (i.e., NO) will cause the program to ask the user to re-enter a "0" or the number of the aircraft to be corrected.

If the group is full, and the user attempts to add more aircraft types, the message

APPROVE CURRENT ENTRIES AND MORE WILL BE ADDED

will appear. Finish correcting and approve the current group then more aircraft type definitions can be added.

4.2.4 Entering Optional Takeoff Profile Data

Takeoff profile data will have been recorded on Takeoff Profile Data Sheets. When the Input Module is prepared to accept takeoff profiles it will query:

DO YOU WISH TO ADD OR CHANGE TAKEOFF PROFILES (Y/N)?

If the response does not start with a "Y" (i.e., NO), the input module will go on to approach profile data entry. If the response starts with a "Y" (i.e., YES) the program will query:

HOW MANY?

The response must be an integer between 0 and 99, inclusive. If the response is 0, no takeoff profiles will be accepted and the program will go on to approach profiles.

The following entries are required for each takeoff profile.

TAKEOFF PROFILE NUMBER:

The response must be an integer between 1 and the number of INM takeoff profiles or 201 and 250, inclusive.

ENTER THE PROFILE LABEL

The entry may be up to 68 characters long.

DO YOU WISH TO ENTER TRACK DISTANCES IN FEET INSTEAD OF NAUTICAL MILES (Y/N)?

If the response starts with a "Y" (i.e., YES), all distance-from-runway-end entries for the profile, must be in feet. If the response does not start with a "Y" (i.e., NO) all distance-from-runway-end entries for the profile must be in nautical miles.

HOW MANY ENGINES ON AIRCRAFT:

The response must be a number up to 7 characters long, not including an optional decimal point.

TAKEOFF WEIGHT (LBS):

The response must be a number up to 7 characters long, not including an optional decimal point.

The data for each of the seven segments must be entered. Each segment requires up to 4 entries. The first segment requires only a thrust entry. The second segment does not require a height entry. The last segment does not have a thrust entry.

The first entry, except for segment 1, is the distance from the runway end in feet or nautical miles. This must be a number up to 7 characters long, not counting an optional decimal point. Enter after

SEGMENT 2

DISTANCE FROM RUNWAY END:

The second entry, except for the first two segments, is the altitude of the aircraft above the runway, in feet. This must be a positive number up to 7 characters long not counting an optional decimal point. Enter after

HEIGHT ABOVE RUNWAY:

The third entry is the airspeed in knots of the aircraft and may be up to 7 characters long not including an optional decimal point. Enter after

AIR SPEED:

The last entry is the thrust setting in pounds per engine. It must be a number up to 7 characters long not including an optional decimal point. Enter after

THRUST:

After 5 profile entries, and when all profiles have been entered, the last group of profiles will be displayed and the user will be asked to approve or change them.

PROFILE 18 REPLACEMENT B727-200 T.O. PROFILE

3. ENGINES TAKEOFF WEIGHT (LBS): 120000.

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	0.	0.	32.	15000.
2	5000.	0.	160.	15000.
3	25000.	2000.	160.	15000.
4	50000.	4500.	160.	15000.
5	75000.	7000.	160.	15000.
6	100000.	9500.	160.	15000.
7	150000.	14500.	160.	15000.

PROFILE 201 AIRCRAFT Y SHORT RANGE T.O. PROFILE

3. ENGINES TAKEOFF WEIGHT (LBS): 300000.

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	0.	0.	32.	30000.
2	5000.	0.	200.	30000.
3	25000.	2000.	200.	30000.
4	50000.	4500.	200.	30000.
5	75000.	7000.	200.	30000.
6	100000.	9500.	200.	30000.
7	150000.	14500.	200.	

PROFILE 202 AIRCRAFT Y LONG RANGE T.O. PROFILE

3. ENGINES TAKEOFF WEIGHT (LBS): 350000.

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	0.	0.	32.	30000.
2	10000.	0.	250.	30000.
3	20000.	2000.	250.	30000.
4	50000.	4000.	250.	30000.
5	70000.	6000.	250.	30000.
6	100000.	9000.	250.	30000.
7	150000.	14000.	250.	

ENTER THE NUMBER OF ANY INCORRECT PROFILE ENTER 0
IF ALL ARE CORRECT:

The response must be an integer from 0 to the number of takeoff profiles or 201 to 250, inclusive. If the response is "0", the group of takeoff profiles will be copied to the airport data file and the program will continue. If the response is the number of any profile in the group, the user will be permitted to change the profile by responding to the following questions.

IS THE PROFILE NUMBER CORRECT (Y/N)?

If the response starts with a "Y" (i.e., YES), the program

will continue, otherwise it will query:

TAKEOFF PROFILE NUMBER:

The response to this must be an integer between 1 and the number of INM takeoff profiles or 201 and 250, inclusive.

Next the program will ask

IS THE TITLE CORRECT?

If the response starts with a "Y" (i.e., YES), the program will skip the next query. Otherwise it will query:

TYPE IN THE PROFILE TITLE:

The response may be up to 68 characters long. Respond to

DO YOU WISH TO ENTER TRACK DISTANCES IN FEET INSTEAD OF NAUTICAL MILES (Y/N)?

as explained above.

ARE THE NUMBER OF ENGINES AND TAKEOFF WEIGHT CORRECT (Y/N)?

If the response does not start with a "Y" (i.e., NO), the user must respond to

HOW MANY ENGINES ON AIRCRAFT:

TAKEOFF WEIGHT (LBS):

as explained above.

WHICH SEGMENT DO YOU WISH TO CHANGE?

ENTER 0 WHEN FINISHED:

will await the entry of an integer between 0 and 7, inclusive. If "0" is entered, the program will go on to the next profile. If any other number is entered, the user will be asked to enter the values

or that segment, as explained above. The query will be repeated until the user enters "0."

The user may enter takeoff profiles beyond the number of profiles indicated. When the last group of profiles is being checked, enter the number of a profile that is to be added after

ENTER THE NUMBER OF ANY INCORRECT PROFILE

ENTER 0 IF ALL ARE CORRECT:

The program will respond with:

DO YOU WISH TO ADD THIS PROFILE (Y/N)?

If the response begins with a "Y" (i.e., YES), the user will be asked to enter another profile, as explained above. The profile number will have to be entered again also. If the group (of 5 profiles) is full, the message:

APPROVE ENTERED PROFILES AND MORE WILL BE ADDED

will appear and the user will be asked to enter more profiles after the current group is correct and approved.

4.2.5 Entering Approach Profile Data

Approach profile data will have been recorded on Approach Profile Data Sheets. When the Input Module is prepared to accept approach profiles it will query:

HOW MANY APPROACH PROFILES ARE THERE:

The response must be an integer between 1 and 50, inclusive. Then the following entries must be made for each profile.

After

APPROACH PROFILE 1

ENTER THE LABEL

The entry may be up to 68 characters long.

HOW MANY SEGMENTS ARE ON THE PROFILE?

The response must be an integer between 5 and 10, inclusive. Then the data for each segment must be entered. Each segment requires up to 4 entries. The first segment does not have a distance entry and the last segment does not have a thrust entry.

The first entry, for all except the first segment, is the distance in nautical miles from the runway end to the start of the segment. This must be a number up to 7 characters long, including an optional minus sign but not counting an optional decimal point. Enter after

SEGMENT 2

DISTANCE FROM RUNWAY END:

The second entry is the altitude of the aircraft above the runway in feet. This must be a positive number up to 7 characters long not counting an optional decimal point. Enter after

HEIGHT ABOVE RUNWAY:

The third entry is the airspeed in knots of the aircraft and may be up to 7 characters long including an optional minus sign but not counting an optional decimal point. The user may enter "LAND" instead of a number. Enter after

AIR SPEED:

The last entry is the thrust setting in pounds per engine. This entry may be up to eight characters long. It may be a number, including optional decimal point and minus sign, but will usually be a sequence of characters. This indicates special thrust settings for each aircraft and must meet one of the following requirements in the first twenty characters:

contain 'APP' and '3'

contain 'LAND' and '6'

contain 'LAND' and not contain '6'

contain 'MAN' and not contain 'S'

contain 'IDLE'

contain 'REV'

Only the last segment on the profile will not have a thrust setting. For all others enter the thrust setting after

THRUST:

After 5 profile entries, and when all profiles have been entered, the last group of profiles will be displayed and the user will be asked to approve or change them.

PROFILE 1 STANDARD 3 DEGREE APPROACH

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	STOP	0.	32.	REV
2	-.165	0.	-2.	-3.
3	2.975	1000.	-2.	-6.
4	9.255	3000.	-2.	-6.
5	12.395	4000.	-2.	-6.
6	18.675	5000.	-2.	

PROFILE 2 STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	STOP	0.	32.	-10.
2	-.165	0.	-2.	-3.
3	2.975	1000.	-2.	-6.
4	9.25	3000.	-2.	-5.
5	12.	3000.	-2.	-6.
6	15.14	4000.	-2.	

PROFILE 3 GA 3 DEGREE APPROACH

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	STOP	0.	32.	-3.
2	-.165	0.	-2.	-3.
3	2.975	1000.	-2.	-3.
4	9.255	3000.	-2.	-3.
5	12.395	4000.	-2.	-3.
6	18.675	5000.	-2.	

ENTER THE NUMBER OF ANY INCORRECT PROFILE, ENTER 0 IF ALL ARE CORRECT:

The response must be an integer from 0 to 50, inclusive. If the response is "0", the group of approach profiles will be copied to the airport data file and the program will continue. If the response is the number of any profile in the group, the user will be permitted to change the profile by responding to the following questions

IS THE TITLE CORRECT?

If the response starts with a "Y" (i.e., YES), the program will continue. If not, the query

TYPE IN THE PROFILE TITLE:

will let the user correct the title.

DO YOU WISH TO CHANGE THE NUMBER OF SEGMENTS ON THE PROFILE?

If the answer starts with a "Y" (i.e., YES), the user must respond to

HOW MANY SEGMENTS ARE ON THE PROFILE?

with an integer from 5 to 7. When done, or if the response does not start with a "Y", the query

WHICH SEGMENT DO YOU WISH TO CHANGE?

ENTER 0 WHEN FINISHED.

will await the entry of an integer between 0 and 7, inclusive. If 0 is entered the program will go on to the next profile. If any other number is entered, the user will be asked to enter the values for that segment, as explained above. Then the query will be repeated until the user enters 0.

The user may enter profiles beyond the number of profiles indicated; when the last group is being checked, enter a number higher than that of any profile already entered after

ENTER THE NUMBER OF ANY INCORRECT PROFILE

ENTER 0 IF ALL ARE CORRECT:

and the user will be asked to enter another profile. If the group (of 5) is full, the message

APPROVE ENTERED PROFILES AND MORE WILL BE ADDED

will appear and the user will be asked to enter more profiles after the current group is corrected and approved.

4.2.6 Entering Optional Approach Parameter Data

When the INM Input Module is ready to accept approach parameter data it will query

DO YOU WISH TO ADD OR CHANGE APPROACH PARAMETERS (Y/N)?

Any response which does not start with "Y" (i.e., NO) will cause the program to go on to optional noise curve data. If the response starts with a "Y" (i.e., YES), the program will query

HOW MANY?

The response must be an integer between 0 and 24 inclusive. If the entry is 0, the program will go on to optional noise curve data. Any other number will be the number of approach parameter sets requested by the program.

The approach parameter data will be entered in groups of five. After each group has been entered and corrected, it will be copied to the airport data file and the program will go on to the next group of five sets of approach parameters. The last group of approach parameters may have fewer than 5 sets of data in it.

Each set of data requires the following entries

APPROACH PARAMETER NUMBER:

The entry must be an integer between 1 and the number of INM approach parameters or 101 and 150 inclusive.

AIRCRAFT NAME:

The entry may be any combination of up to 12 characters.

LANDING WEIGHT (LBS):

This entry must be a number up to 9 characters long (not counting an optional decimal point).

NUMBER OF ENGINES:

This entry must be a number up to 9 characters long (not counting an optional decimal point.)

The following entries must each be a number up to 7 characters long (not counting an optional decimal point):

LANDING ROLL DISTANCE (FEET):

LANDING SPEED (KNOTS):

THRUST FOR 3 DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):

THRUST FOR 6 DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):

THRUST FOR LEVEL FLIGHT WITH APPROACH FLAPS (LBS/ENG):

THRUST FOR 3 DEG GLIDE SLOPE WITH APPROACH FLAPS (LBS/ENG):

THRUST FOR LEVEL FLIGHT WITH MANEUVER FLAPS (LBS/ENG):

THRUST FOR 500 FT/NMI DESCENT WITH MANEUVER FLAPS (LBS/ENG):

THRUST FOR IDLE (LBS/ENG):

THRUST FOR REVERSAL (LBS/ENG):

When the entire group has been entered, it will be displayed and the user will be asked to correct or approve the entries. Zero is an acceptable entry for any of the last six thrust settings. The display will show the value of each parameter after an abbreviation of the parameter name.

```
101 ACFT x           WEIGHT-       100000.                4. ENGINES
TO STOP      5000.  LAND             150. 3DG LND    10000. 6DG LND
 LVL APP           3DG APP       10000. LVL MAN             SNK MAN
   IDLE             REVERSE      15000.
102 ACFT Y           WEIGHT-       200000.                3.  ENGINES
TO STOP      3000.  LAND             180. 3DG LND    15000.  6DG LND 8000.
 LVL APP    10000.3DG APP        12000. LVL MAN       7000.  SNK MAN 7500.
   IDLE      4000. REVERSE       20000.

ENTER THE NUMBER OF ANY INCORRECT AIRCRAFT ENTER 0 IF ALL ARE
CORRECT:  IF NECESSARY
```

If all the parameters are correct, enter a "0" and they will be copied to the airport data file and the program will go on to the next group. If any entry in the group contains an error, enter the approach parameter number (as entered if it is incorrect) of that entry. The program will then ask that the entire approach parameter be re-entered. The user should re-enter approach parameters until all in the group are correct. Then enter a "0".

If the user wishes to enter more sets of approach parameters than specified in the response to "HOW MANY?", they must be added after the last correctly counted entry. When the program asks the user to approve or correct the last group, enter the number of a set of approach parameters that has not been entered. Keep entering sets until all have been entered by entering a new number when asked to correct or approve the current group.

If the group of 5 is filled, the user will be asked to APPROVE CURRENT ENTRIES AND MORE WILL BE ADDED. When the current group has been corrected and approved, the program will ask for more approach parameter data.

4.2.7 Entering Optional Noise Curve Data

Optional noise curve data (if any) will have been recorded on data sheets. When the Input Module reaches the noise curve data section it will ask

DO YOU WISH TO ADD NOISE CURVE DATA SETS (Y/N)?

Any response starting with a "Y" (i.e., YES) will result in the user being able to add noise curve data sets. Any other response will result in the Input Module going on to the Aircraft Traffic Mix Section.

The next question will be

HOW MANY?

The response must be an integer between 0 and 24, inclusive. If the answer is "0", the Input Module will go on to the Aircraft Traffic Mix section.

The user will then be asked to enter and check each noise curve individually. When approved, the noise curve data set will be copied to the airport data file.

Each noise curve data set will require the following entries

NOISE CURVE IDENTIFICATION NUMBER:

The response must be an integer between 101 and 120, inclusive.

NOISE CURVE TITLE:

Any combination of numbers, letters, punctuation, and spaces up to 30 characters long.

NUMBER OF THRUST VALUES:

ID Number	AIRCRAFT IDENTIFIER Type	AIRCRAFT IDENTIFIER Name	Maximum Stage Length Category
1	2E NB TF	DC-9-32	1500 - 2500
2		DC-9-15	1500 - 2500
3		BAC-111	1500 - 2500
4		737/100-200	1500 - 2500
5	3E NBTF	727-200	1500 - 2500
6		727-100	1500 - 2500
7		707-320B/C	4500+
8		707-120B	4500+
9		720B	4500+
10		DC-8-55	4500+
11		DC-8-61/63	4500+
12		Convair-990	4500+
13	4E NTJ	707-120/320	4500+
14		720	4500+
15		DC-8-30	4500+
16		Convair-880	4500+
17		VC-10	4500+
18	STOL	F-28-2000	1000 - 1500
19	SST	Concorde	4500+
20	2 EWB	A300 Airbus	2500 - 3500
21	3E MRWB	DC-10-10	4500+
22	3 ENG WB	L-1011	4500+
23	3E LRWB	DC-10-30	4500+
24	3E LRWB	Stretch	4500+
25	4 ENG WB	747-200	4500+
26		747-100	4500+
27		747 Stretch	4500+
28		DC9 w/SAM Engines	1500 - 2500
29		737 w/SAM Engines	1500 - 2500
30		727 w/SAM Engines	1500 - 2500

FIGURE 4.2-1. AIRCRAFT DATA

ID Number	AIRCRAFT IDENTIFIER Type	Name	Maximum Stage Length Category
31		707 w/SAM Engines	4500+
32		DC8 w/SAM Engines	4500+
33		727 ADV w/SAM Engines	1500 - 2500
34	2ETPQ GA	F-27 FOKKER	1000 - 1500
35	LTJ GA	Light Turbo Jet	0 - 500
36	MTJ GA	Medium Turbo Jet	1000 - 1500
37	HTJ GA	Heavy Turbo Jet	1000 - 1500
38	MTF GA	SABRELINER	1000 - 1500
39	MTEP GA	TWIN OTTER	500 - 1000
40	LTEP6	CESSNA 310	0 - 500
41	LSEP2 GA	CESSNA 150 GRUMMAN TRAINER	
42	LSEP4 GA	CESSNA 172, PIPER CHEROKEE WARRIOR, PIPER 180	0 - 500
43	MSEP6 GA	CESSNA 182, PIPER CHEROKEE SIX/16	0 - 500
44	MTEP10Q GA	COMMANDER 685	0 - 500
45	MTEP10L GA	BEECH QUEENAIR, PIPER NAVAJO CHIEFTAIN	0 - 500
46	LQTF GA	CESSNA CITATION	1000 - 1500
47	HTF GA	JETSTAR II, GULFSTREAM	1500 - 2500
48	MILITARY	F-101 B, C, F	2500 - 3500
49		F-104	500 - 1000
50		F-5 A, B	500 - 1000
51		F-5 E	500 - 1000
52		T-33 A	1000 - 1500
53		C-5A	4500+

FIGURE 4.2-1. AIRCRAFT DATA (CONT'D)

ID Number	AIRCRAFT IDENTIFIER Type	Name	Maximum Stage Length Category
54		C-141A	3500 - 4500
55		C-130E	2500 - 3500
56		C-130 H, N, P	2500 - 3500
57		C-131	1000 - 1500

FIGURE 4.2-1. AIRCRAFT DATA (CONT'D)

This must be an integer from 2 to 6, inclusive. Depending on this entry, 2 to 6 sets of the following entries will be requested.

CORRECTED NET THRUST/ENG (LBS):

This entry must be a number up to 7 digits long (not counting an optional decimal point).

EPNL AT 200 FT (DECIBELS):

EPNL AT 400 FT (DECIBELS):

EPNL AT 600 FT (DECIBELS):

EPNL AT 1000 FT (DECIBELS):

EPNL AT 2000 FT (DECIBELS):

EPNL AT 4000 FT (DECIBELS):

EPNL AT 6000 FT (DECIBELS):

EPNL AT 10000 FT (DECIBELS):

NEL AT 200 FT (DECIBELS):

NEL AT 400 FT (DECIBELS):

NEL AT 600 FT (DECIBELS):

NEL AT 1000 FT (DECIBELS)

NEL AT 2000 FT (DECIBELS):

NEL AT 4000 FT (DECIBELS):

NEL AT 6000 FT (DECIBELS):

NEL AT 10000 FT (DECIBELS):

Each of these entries must be a number up to 6 digits long (not counting an optional decimal point). After each entry, the

entire noise curve data set will be displayed and the user will be queried.

```
101                        TABLES FOR AIRCRAFT Y
#   THRUST FEET: 200  400  600  1000  2000  4000  6000  10000
EPNL
1   30000.      105. 100.  90.   90.   85.   80.   75.    70.
2   20000.      100.  95.  95.   85.   80.   75.   70.    65.
3   10000        95.  90.  85.   80.   75.   70.   65.    60.
NEL
1   30000.      100.  95.  90.   85.   80.   75.   70.    65.
2   20000.       95.  90.  85.   80.   75.   70.   65.    60.
3   10000.       90.  85.  80.   75.   70.   65.   60.    55.
IS THE NOISE CURVE DATA CORRECT?
```

If the response starts with a "Y" (i.e., YES), the program will copy the noise curve data to the airport data file. Any other response will result in

ARE THE NOISE CURVE NUMBER AND TITLE CORRECT?

If the response does not start with a "Y" (i.e., NO), the user will be asked to re-enter the noise curve number and title as explained above. After the correction or any other response to the above query, the user will be asked

IS 2 THE CORRECT NUMBER OF THRUST VALUES?

The correct number will be used for 2 above. If the response does not start with a "Y" (i.e., NO), the user will be asked to replace the number of thrust values. The program will then query

ENTER THE NUMBER OF ANY THRUST SETTING LINE CONTAINING AN ERROR, ENTER 0 IF ALL ARE CORRECT:

The thrust setting line number is the first number on each line of noise data displayed. To replace or add data enter the number of the line to be replaced. The entire line (i.e., thrust setting and all 16 noise levels) must then be entered. It is the user's responsibility to add or change the necessary lines if the number of thrust values was changed as shown above.

When all the noise curve data sets have been entered and approved, the program will query

DO YOU WISH TO ADD ANOTHER NOISE CURVE DATA SET?

Any response that starts with a "Y" (i.e., YES) will result in the user being asked to enter another noise curve data set. Any other response will cause the computer to go on to the Aircraft Traffic Mix section.

4.2.8 Entering Traffic Mix Data

When the Input Module reaches the traffic mix section it will start asking for entries without any indicating message. The data should be recorded on Traffic Mix Data Sheets.

For each set of operations make the following entries. After

AIRCRAFT TYPE:

enter the aircraft type number (Figure 4.4.1) as an integer or the aircraft name may be entered. Aircraft defined by the user may only be identified by number. The name is entered as a line of up to 20 characters. Figure 4.4.1 shows the aircraft names.

The underlined characters are those that the Input Module uses to identify the aircraft type that the entry indicates. For example, a DC-8 55 could be entered as

DC-8 55

DC855

DC855 (minimal acceptable entry)

DZZZX800055

As long as the minimal acceptable entry characters are entered before any other acceptable set of characters, the entry will be properly identified.

Entry of traffic-mix data is ended by entering zero (0) as an aircraft type.

The next entry is the track associated with the flights being entered. This must be an integer from 1 to 88.

Enter after

TRACK NUMBER:

The approach profile associated with the traffic may then be entered. An approach profile number is not required if there are no arrivals in the entry. This must be an integer between 0 and 50. Enter after

APPROACH PROFILE NUMBER:

Next, three entries must be made for average daily arrival, one each for day, evening, and night. Entries may be any positive number up to 2 digits long, not including an optional decimal

point. An entry of zero "0" is acceptable, as are fractional entries (1.2, 0.3, etc.) so long as no more than two numerals are entered. An example of this is

```
DAILY ARRIVALS
2.5                    DAY:

.5                 EVENING:

.75                  NIGHT:
```

The same type of entries are required for departures which are divided into groups based on the length of the flight and then entered just as arrivals are.

There are seven possible flight stage-length categories. Not all aircraft types are capable of using all stage lengths. The Input Module will not ask for entries beyond an aircraft's maximum range. The maximum stage length for each aircraft type is listed in Figure 4.4-1. It is not necessary to have departures for all possible stage lengths and once actual departures have been entered, a minus sign (-) as the next entry will terminate input for that aircraft traffic mix entry. As for arrivals, entries of zero (0) are acceptable.

```
  1 AIRCRAFT:  BAC  111  TRACK:  7 PROFILE:   0 ARRIVALS DAY:  0. EVN:  0. NIGHT: 0.
DEPARTURES  RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT
             0-500    3.   1.   1.  500-1000   2.  1.5       1000-1500

  2 AIRCRAFT:  BAC  111  TRACK   8 PROFILE:   0 ARRIVALS DAY:  0. EVN.  0. NIGHT: 0.
DEPARTURES  RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT
             0-500    0.   0.   0.  500-1000   0.   0.   0. 1000-1500   3.   1.   1.
         1500-2500    2.   0.  1.5 2500-3500                 3500-4500

  3 AIRCRAFT:  BAC  111  TRACK:  9 PROFILE:   1 ARRIVALS DAY:  9. EVN:  4. NIGHT:  4.

  4 AIRCRAFT:  727  200  TRACK:  6 PROFILE:   2 ARRIVALS DAY:  4. EVN:  3. NIGHT:  2.
DEPARTURES  RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT
             0-500    2.   1.   0.  500-1000   2.   1.   0. 1000-1500   2.   1.

  5 AIRCRAFT:  707 120B  TRACK:  3 PROFILE:   1 ARRIVALS DAY: 10. EVN:  2. NIGHT:  5.
DEPARTURES  RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT   RANGE    DAY  EVN  NGT
             0-500    5.   1.   3.  500-1000   2.   0.   1. 1000-1500   3.   0.   1.
         1500-2500    1.               2500-3500              3500-4500

   ENTER THE NUMBER OF ANY INCORRECT ENTRY, ENTER 0 IF ALL ARE CORRECT:
```

```
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 to 500 DAY:
1
                           EVENING:
0
                             NIGHT:
.14
STAGE LENGTH  500 to 1000 DAY:
.43
                           EVENING:
.29
                             NIGHT:
.29
STAGE LENGTH 1000 to 1500 DAY:
-
```

After every five sets of aircraft mix data and when done, the program will display the last group of entries and ask the user to approve or correct the group.

The entry must be an integer between 0 and 200, inclusive. If the entry is 0, the group of mix data is copied to the airport data file and the program continues. If the number entered is the number of one of the entries in the group, the user will be asked to make the entry again. The user will be asked to do this until the group is approved.

4.2.9 Entering Takeoff Modification Data

If there are any takeoff modifications, the data will be entered on Takeoff Modification Data Sheets. When the Input Module reaches this section it will query:

DO YOU WISH TO ADD ANY TAKEOFF MODIFICATIONS?

If the response starts with a "Y" (i.e., YES), the user will be asked to enter takeoff modifications, otherwise, the airport case study input is now finished.

If takeoff restrictions are to be added, the program will ask:

DO YOU WISH TO ENTER ANY OVERRIDES OF TAKEOFF MODIFICATIONS (Y/N)?

If the response starts with an "N" (i.e., NO), the program will go on to accept modification entries. Otherwise the program will query:

NOISE CURVE SET NUMBER ENTER 0 IF DONE:

The entry must be an identification number from the data base. A "0" ends entry of overrides. Enter the numbers that are

opposite NOISE CURVE NUMBER on the data sheet. Then the program will query:

OVERRIDE TYPE:

This entry must be an integer between 0 and 3, inclusive. Enger the number below (on the data sheet) the noise curve number just entered.

When all the overrides have been entered, they will be displayed and the user will be asked to approve or correct them.

```
NOISE CURVE SET   1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
OVERRIDE  NUMBER  0  0  0  0  0  0  0  0  0  0     0  0  0  0  0  0  0  0  0
ENTER NOISE CURVE NUMBER WITH INCORRECT OVERRIDE, ENTER 0 IF ALL ARE CORRECT:
```

An entry of "0" will cause the overrides to be kept as written. An integer from 1 to 60 will let the user replace the override of that noise curve. A "0" means no override and if the user incorrectly gives a noise curve an override, it should be restored to "0".

When the overrides are finished the program will ask

HOW MANY MODIFICATIONS ARE THERE?

The response must be an integer between 1 and 25. The restrictions are then entered. Each modification requires the following:

MODIFICATION 1 TYPE:

must be an integer between 1 and 5, inclusive. See Section 2.3.5. Only if the modification type is 5 will the program query:

GRADIENT:

The entry must be a number up to 7 digits long, not counting an optional decimal point.

The next two entries will be

START:

END:

The responses must be numbers up to 7 digits long, not counting an optional decimal point.

The next query is

AFFECTED TRACK ENTER 0 IF DONE:

The entries must be integers between 0 and 88, inclusive. Enter "0" after all the affected tracks have been entered. Up to 10 entries are permitted.

After every 5 modifications have been entered, and when done, the program will display the last group of entries and ask the user to approve or correct them.

```
#    REST TYP GRADIENT  START      END          TRACKS AFFECTED
1          1            3000.      10.  3  0  0  0  0  0  0  0  0  0
2          5      .04   3.      8000.  7  8  0  0  0  0  0  0  0  0
ENTER THE NUMBER OF ANY RESTRICTION WITH AN ERROR
ENTER A 0 IF ALL ENTRIES ARE CORRECT:
```

The entry must be an integer between 0 and 25, inclusive. If the entry is "0" the program will go on to the next group. If the entry is the number of a restriction in the group, the user will be asked to replace that modification and the query will be repeated until a "0" is entered.

The user may add modifications beyond the number specified

above (though not more than 25 total) by entering a number greater than the number of restrictions entered when asked to approve or correct the last group.

4.3 ENTERING OUTPUT SPECIFICATIONS

After the user starts the INM Input Module using the appropriate computer command, the program will query

```
ENTER THE ACTION YOU WISH TO PERFORM:
```

Any response starting with "CO" (i.e., CONTROL) will let the user create run-time files containing a set of airport data and output specifications.

The output specifications will be on Grid Output Specification Sheets or Contour Output Specification Sheets.

The program will query

```
WHAT TITLE DO YOU WISH TO HAVE APPEAR ON THE OUTPUT?
IT MAY BE UP TO 80 CHARACTERS LONG:
```

The entry may be any combination of characters up to 80 (including spaces and punctuation).

Next the program will display

```
TYPE GRID.  TO DO GRID ANALYSIS.
TYPE COUNTER FOR CONTOUR DRAWING:
```

If the response starts with a "C" (i.e., CONTOUR), the program will ask for contour output specifications. If the response starts with a "G" (i.e., GRID), the program will ask for grid output specifications.

4.3.1 Entering Grid Output Specifications

The following entries are required for each grid specified. The first query will be

```
DO YOU WISH TO ENTER ALTERNATE THRESHOLD VALUES?
DEFAULT VALUES ARE 65, 75, 85, 95, 105, and 115 dB:
```

Enter the response circled on the data sheet. If the response starts with a "Y" (i.e., YES), the program will ask for six entries

```
ENTER SIX THRESHOLD VALUES IN INCREASING ORDER.
THRESHOLD:
```

Enter the numbers in the order listed on the data sheet. Each entry may be up to 9 digits long, not counting an optional decimal point. When all entries have been made, they will be displayed and the program will ask:

```
ARE ENTRIES CORRECT?
```

If the response starts with an "N" (i.e., NO), the user must reenter the alternate threshold values.

```
STARTING X-COORDINATE:

STARTING Y-COORDINATE:

X-INCREMENT:

Y-INCREMENT:
```

Each of these entries must be a number up to 9 digits long, not counting an optional decimal point. The next queries

```
NUMBER OF X-VALUES:

NUMBER OF Y-VALUES:
```

require integer entries up to 5 digits long.

The program will ask

DO YOU WISH TO USE THE DETAILED PRINTOUT OPTIONS?

Any response that does not start with a "Y" (i.e., YES) will cause the program to ask the next few questions, otherwise the program will ask about checking the set of grid specifications.

PRINT THE CONTRIBUTION OF EACH NOISE CURVE SET TO THE TOTAL NOISE AT A POINT?

PRINT DETAILED INFORMATION FOR EACH FLIGHT AT A POINT?

Any answer starting with a "Y" (i.e., YES) will cause the Integrated Noise Model to produce the selected detailed output.

The program will display the grid specifications and ask the user to approve or correct them.

```
START X   START Y   INC X   INC Y  # X  # Y OPTIONS
  1000.     500.     500.    700.   5    4
ANY ERRORS:
```

If the response starts with a "Y" (i.e., YES), the grid specifications will be copied to the run-time file. Any other response will cause the program to have the user reenter all of the grid specifications.

When the grid is correct the program will ask

DO YOU WISH TO ADD ANOTHER GRID?

If the response starts with a "Y" (i.e., YES), the user will be asked to enter another set of grid specifications, otherwise the run-time file is now complete.

4.3.2 Entering Contour Specifications

The following entries are required for each contour specified.

ENTER THE DESIRED METRIC

NEF - NOISE EXPOSURE FORECAST

LDN - DAY-NIGHT AVERAGE SOUND LEVEL

CNEL - COMMUNITY NOISE EQUIVALENT LEVEL

LEQ - EQUIVALENT SOUND LEVEL

The response must start with one of the set of characters on the left above (NEF, etc.).

The next query will be

ENTER CONTOUR VALUE TO BE USED, 0 WILL END ENTRIES:

CONTOUR VALUE:

The response must be a number up to 5 digits long not counting an optional decimal point. If the response is "0", no more contour data will be asked for.

DO YOU WANT TO ENTER OPTIONAL SPECIFICATIONS?

If the response starts with a "Y" (i.e., YES) the user will be asked to enter other possible contour specification data. Any other response will have the program ask the user to approve or correct the contour specifications.

The optional contour specification queries are

```
CONTOUR VALUE TOLERANCE:
STARTING X-COORDINATE:
STARTING Y-COORDINATE:
MAXIMUM STEP SIZE:
STOPPING X-COORDINATE:
STOPPING Y-COORDINATE:
```

The response for each of these must be a number up to 9 digits long, not counting an optional decimal point. If there is no entry for an item on the data sheet, enter a "0" on the terminal.

```
MAXIMUM NUMBER OF CONTOUR POINTS:
```

The reponse must be a number up to 8 digits long, not counting an optional decimal point. Enter a "0" if there is no entry on the data sheet.

The program will display the entire contour entry and ask the user to approve or correct it.

```
VALUE   TOLERANCE  X-START  Y-START  MAX STEP  X-STOP  Y-STOP  MAX #
  40.
IS THE ENTRY CORRECT (Y/N)?
```

If the response starts with an "N" (i.e., NO), the user will be asked to re-enter the contour specification. Otherwise, the program will go on to the next contour.

5.0 RUNNING THE CASE

In the previous three sections case preparation and input into the INM have been described. Section 5 will describe the procedures for running the INM case on a computer system.

The input case file, as prepared in Section 4, will be identified and made available to the INM on the computer system. The case will be processed and outputs created. Since the computer related instructions vary significantly between systems, no further discussion will be made here.

The assembled input case is now ready to be submitted to a computer timesharing service to run the model. The input case will be combined with instructions which make the INM available to be run, the desired program is executed, and the results returned. These instructions vary from system to system, so they will not be discussed further here. However, if the user is interested, a supplement to this manual should be available from the timesharing service which describes the procedure for running the model.

5.1 INPUT CASE CHECKLIST

The assembled input case for the example airport is shown in Figure 5.1-1. The input case should be closely inspected for completeness prior to executing the INM. Every input case must contain the following data sections:

```
 EXAMPLE AIRPORT SCENARIO
NEF
100   1              AIRPORT SECTION
         0.        15.0
  1  10000.         0.                 0.        0.            27  9 T.O. RWY 27
  2      0.         0.             10000.        0.             9 27 T.O. RWY  9
  3   7000.     -7000.              2000.     2000.            31 13 T.O. RWY 31
  4   2000.      2000.              7000.    -7000.            13 31 T.O. RWY 13

 1 1 1  50.
 1 2 3   .5  45.  1.5  50.
 3 3 1  50.
 2 4 5   .5  90. -1.5  1.5   0.  45. -1.5  50.
 2 5 1  50.
 2 6 3   .5  10.  1.5  50.
 4 7 3   .5  30. -1.5  50.
 4 8 3  1.0  30. -1.5  50.
 4 9 1  50.

107                AIRCRAFT SELECTION SECTION
 3. 5. 8.43

101                PROFILE SECTION
301              STANDARD 3 DEGREE APPROACH
      -1.0    -.165   2.975   9.255  12.395  18.675
       0.0      0.0   1000.   3000.   4000.   5000.
       32.      -2.     -2.     -2.     -2.     -2.
      -10.      -3.     -6.     -6.     -6.
302              STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
      -1.0    -.165   2.975   9.255     12.   15.14
       0.0      0.0   1000.   3000.   3000.   4000.
       32.      -2.     -2.     -2.     -2.     -2.
      -10.      -3.     -6.     -5.     -6.
303              GA. 3 DEGREE APPROACH
      -1.0    -.165   2.975   9.255  12.395  18.675
       0.0      0.0   1000.   3000.   4000.   5000.
       32.      -2.     -2.     -2.     -2.     -2.
       -3.      -3.     -3.     -3.     -3.

100   3              AIRCRAFT MIX SECTION
  3 7                 3. 1. 1. 2.1.5
  3 8                                      3. 1. 1. 2.   1.5
  3 9301 9. 4. 4.
  5 6302 4. 3. 2. 2. 1.    2. 1.    2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.    1. 3.    1. 1.
 43 4                 25. 5.10.
 43 230325. 5.10.

CONTOUR
30.
-40.
END
```

FIGURE 5.1-1. THE ASSEMBLED INPUT CASE FOR EXAMPLE AIRPORT

1) Aircraft identification (done automatically by Input Module)
2) Runway data
3) Track data
4) Approach profile data
5) Aircraft mix data
6) Output control specifications

5.2 OUTPUT CHECKLIST

It must be determined that the INM processed the input case correctly prior to utilizing the results for an airport noise analysis. The practices described below should become standard operating procedure.

The INM includes a large number of warning and error messages. The printout should be checked for these messages and, if necessary, the input case should be corrected to produce an error free run. Section 5.4 contains an extensive description of INM warning and error messages.

The INM echoes the input data on the printed output. Verify that the information processed by the program is as intended. For example, the INM will compute runway lengths based upon the start and end coordinates. A runway length of 100 feet should indicate an error in the input case. The aircraft and runway utilization tables should also be checked for accuracy.

5.3 CONTOUR PLOTS

The selection of the contour analysis option of the INM produces two outputs: (1) a report listing the coordinates of equal noise level and (2) a file containing these coordinates stored on magnetic tape. The contour plotting package is designed to access and plot these noise contours. The plotting functions utilized by the program reside in the CALCOMP Basic Software Package for pen plotters, which is supported by a large number of computing systems.

The second input to the contour plot program is a file that specifies which functions the plotting package is to perform. The data file which generated the contour plot for the example airport is presented in Figure 5.3-1.

The first entry on the data form is for the name, or other identifier, of the airport run-time file that was used to create the plot data. The second entry is for the name of the plot control file being created. This file will contain the contour plot specifications. Enter these after

WHICH FILE DO YOU WANT TO PLOT?

NAME THE PLOT CONTROL FILE:

The third entry is for the logical unit number of the tape that contains the contours to be plotted. Enter after

TAPE LOGICAL UNIT NUMBER:

```
TAPES              2.
PLOT               8.
PLTVAR            11.     8000.       0.
RUNWAY            4.0
   1   10000.      0.                 0.        0.       27  9       T.O. RWY 27
   2       0.      0.             10000.        0.        9 27       T.O. RWY  9
   3    7000.  -7000.              2000.     2000.       31 13       T.O. RWY 31
   4    2000.   2000.              7000.    -7000.       13 31       T.O. RWY 13
ALL
REWIND
CATLOG
END
```

FIGURE 5.3-1.

The next entry is for the logical unit number of the final plot output, (i.e., plotter, magnetic tape, CRT, etc.) which is usually dependent on the plotting package and computer system used. Enter after

PLOT DEVICE LOGICAL UNIT NUMBER:

The INM contour plotting program will, unless instructed otherwise, generate a contour plot with the following characteristics:

1) Plot region height of 10 inches
2) Scale of 8000 feet/inch
3) Angular orientation of 0 degrees from the "X" axis of the plotting device.

If these default parameters are not appropriate, enter "YES" to the question,

DO YOU WISH TO SPECIFY THE PLOT SIZE, SCALE, OR ANGLE?

then enter user values after

PLOT HEIGHT (INCHES):

PLOT SCALE (FT/INCH):

ANGLE OF PLOT TO X-AXIS (DEGREES):

To run the Input Module Plot section, start the Input Module and enter PLOT as the action to be performed. Then enter the data on the Contour Plot Data Sheet.

CONTOUR PLOT DATA SHEET

WHICH FILE DO YOU WANT TO PLOT? EXAMP1.RUN

NAME THE PLOT CONTROL FILE: EXAMP1.PLT

TAPE LOGICAL UNIT NUMBER: 2

PLOT DEVICE LOGICAL UNIT NUMBER: 8

DO YOU WISH TO SPECIFY THE PLOT SIZE, SCALE, OR ANGLE? YES

PLOT HEIGHT (INCHES): 11

PLOT SCALE (FT?INCH): 8000

ANGLE OF PLOT TO X-AXIS (DEGREES): 0

5.4 ERROR ANALYSIS AND CORRECTION

The Integrated Noise Model contains a substantial amount of data-checking logic aimed at detecting some of the more common types of errors that can occur in an input run deck. In some cases, data determined to be in error will cause the program to terminate execution. These are known as fatal errors. In other cases, the data is determined to be illogical for normal operating conditions but is possibly correct. These are known as warning errors. In every case when the program determines that an error condition exists, a message describing the error will be printed. This section describes the various INM error messages that can be printed, their severity, their probable causes, the possible corrective measures.

1. <u>THIS VERSION OF INM WILL NOT EXECUTE USING DATA BASES NO. 50 OR GREATER...</u>

    Severity: Fatal

    Cause: An attempt was made to execute the INM with an invalid data base.

    Correction: Use a valid INM data base.

2. <u>FATAL: TAKEOFF THRUST IN SEGMENT XX OF PROFILE XX IS NOT FOR AIRCRAFT XX IS NOT CLOSE TO REFERENCE THRUSTS IN NOISE CURVE XX</u>

    Severity: Fatal

    Cause: Incorrect specification of takeoff thrusts in user defined profile

    Correction: Correct takeoff thrusts.

3. *NO TIME ABOVE VALUES CALCULATED (DIRECTIVITY DATA NOT AVAILABLE FOR NEW AIRCRAFT TYPES)*

Severity: Warning

Cause: New aircraft were defined during execution of grid analysis.

Correction: None

4. ERROR IN INPUT DATA

Severity: Fatal

Cause: This message is usually printed after other explanatory messages. If not, then the last card read by the program is in error.

Correction: If it was the last card read, determine the error and correct it.

5. CONTROL CARD ERROR

Severity: Fatal

Cause: Unrecognizable card in a control card position.

Correction: Replace card with valid control card.

6. THE ABOVE CARD IS IN ERROR

Severity: Fatal

Cause: Unrecognizable process control card.

Correction: Replace card with proper control card.

7. CANNOT FIND THE FIRST POINT

Severity: Fatal

Cause: Program failed to find a point on the contour after many tries. Possibly the contour does not exist.

Correction: If the contour exists, try to specify a point closer to the contour.

8. <u>THE DERIVATIVE IS ZERO</u>

Severity:	Fatal
Cause:	When attempting to compute the location of the first point on a contour the gradient computations resulted in a zero value.
Correction:	Try to start the program closer to where the contour is by changing the specification for the first point location on the contour specification card.

9. <u>AFTER XXX ITERATIONS, THIS CONTOUR IS BEING TERMINATED</u>

Severity:	Fatal
Cause:	To be found by analysis of accompanying data dump which is similar to the option 4 printout of the grid analysis model.
Correction:	To be determined by a detailed check of the input data and of the accompanying data dump provided by the program.

10. <u>CAUGHT IN A LOOP. THIS CONTOUR IS BEING TERMINATED</u>

Severity:	Fatal
Cause:	During the search for a contour point the program found itself connecting with previous points on the contour and not the start point.
Correction:	Set tighter tolerance and smaller step size.

11. <u>MAXPTS EXCEEDED. THIS CONTOUR IS BEING TERMINATED</u>

Severity:	Fatal
Cause:	The "maximum points" value on the contour specification card has been exceeded and the start point is not near.

Correction: More of a recovery than correction; if it is determined that all of the data input is valid and the program is operating properly, make up a new specification card as follows:

1. Use the same noise level measure as this run.
2. Specify the last point printed for this run as the starting point.
3. Use an appropriate step size.
4. Specify the first contour point printed for this run as the last point.
5. Specify an appropriate number of points.

Resubmit the job with this contour specification to get the rest of the contour then put the two runs together. The area inside the contour is the sum of the last printed areas of both runs.

12. <u>ERROR IN TIHISI: INDICATOR = XXX</u>

Severity: Fatal

Cause: The program is not operating properly for a TA calculation.

Correction: The only viable alternative for the user at this time is to delete the TA computation if it is determined that the input data is correct. If this error occurs when executing the Grid Analysis Program, skip the point where the error occurs and continue execution at the next grid point.

13. <u>ILLEGAL RUNWAY NUMBER</u>

Severity: Fatal

Cause: Runway number not in range 1 to 15.

Correction: Use number in proper range.

14. REPETITION OF TRACKS ILLEGAL

Severity: Fatal

Cause: More than 88 entries have been made for track utilization input data.

Correction: Combine the utilization values for repeated track numbers.

15. RUNWAY HAS NOT BEEN DEFINED

Severity: Fatal

Cause: A track has been assigned to a nonexistent runway.

Correction: Define the runway or reassign the track.

16. NUMBER OF SEGMENTS IN ERROR

Severity: Fatal

Cause: Number of track segments not in range of 1 to 15.

Correction: Reduce the number of track segments.

17. 2ND SEGMENT MUST BE A TURN

Severity: Fatal

Cause: Second segment in a track was defined as being straight.

Correction: Redefine the length of the first segment to be long enough to reach the first turn, then define the rest of the track from there.

18. TURN NOT BOUNDED BY STRAIGHT SEGMENTS

Severity: Fatal

Cause: Turns of 180 degrees or more are required to be bounded by straight segments on each side of the turn.

19. <u>TURNS OVER 270 DEG. R ILLEGAL</u>

Severity:	Fatal
Cause:	Self-explanatory
Correction:	Defining a short straight segment in the middle of the turn will handle most cases.

20. <u>CONSEC. TURNS OVER 270 DEGREES</u>

Severity:	Fatal
Cause:	Self-explanatory
Correction:	Define short straight segment between the turns.

21. <u>3 CONSEC. TURNS IN SAME DIREC.</u>

Severity:	Fatal
Cause:	Three consecutive turns in the same direction were present in a track definition.
Correction:	Define a short straight segment between two of the turns.

22. <u>TRACK NUMBER IS IN ERROR</u>

Severity:	Fatal
Cause:	Track number not in the range 1 to 88.
Correction:	Select an appropriate number between 1 and 88.

23. ONLY FOUR AIRCRAFT RETRIEVAL CARDS ARE PERMITTED, A CONTINUATION MARK IN COL. 76 OF THE FOURTH AIRCRAFT RETRIEVAL RECORD HAS CAUSED THE PROGRAM TO STOP.

Severity: Fatal

Cause: An attempt was made to use more than 4 aircraft retrieval cards.

Correction: Correct aircraft retrieval cards.

24. *FATAL: ILLEGAL AIRCRAFT DEFINITION - NO. XX

Severity: Fatal

Cause: 1.) Aircraft number is not in range of acceptable aircraft numbers.

Correction: Correct the aircraft number.

25. *FATAL: ILLEGAL PROFILE I.D. - XX

Severity: Fatal

Cause: Takeoff profile I.D. number greater than 104 for data base profiles or not in range of 201 to 250 for user defined profiles.

Correction: Change it to a correct number.

26. *FATAL: ILLEGAL NOISE CURVE I.D. - XX

Severity: Fatal

Cause: Noise curve I.D. number greater than 41 for data base noise curves or not in range of 101 to 150 for user defined noise curves.

Correction: Change it to a correct number.

27. *FATAL: ILLEGAL APPROACH PARAMETER I.D. - XX

Severity: Fatal

Cause: Approach parameter set greater than 41 for database definitions or not in range of 101 to 150 for user defined approach parameter I.D.'s

Correction: Change it to a correct number

28. *FATAL: REPLACEMENT OR NEW AIRCRAFT I.D. NUMBERS MUST BE STRICTLY INCREASING

Severity: Fatal

Cause: Aircraft definition records not sorted ascending.

Correction: Reorder the aircraft definition records.

29. ERROR IN PROFILE NUMBER - XX

Severity: Fatal

Cause: Profile I.D. number not in following ranges

1) 1 - 104 replacement T.O. profile
2) 201 - 250 user defined T.O. profile
3) 301 - 350 landing profile

Correction:

30. DISTANCE NUMBER XX ABOVE IS SUSPECT

ALTITUDE NUMBER XX ABOVE IS SUSPECT

VELOCITY NUMBER XX ABOVE IS SUSPECT

Severity: Warning

Cause: Values specified are not monotonically increasing. Indicators in velocity card are not checked.

Correction: Correct data if necessary.

31. ILLEGAL APPROACH PARAMETER NO.

Severity: Fatal

Cause: Approach parameter number not in the range 1 to 11

Correction: Select a number in the proper range corresponding to the number of the noise curve set to which the approach parameters apply.

31. ERROR IN GROUND ROLL DISTANCE

Severity: Fatal

Cause: Ground roll distance is a positive value.

Correction: Set the ground roll entry to the negative of the roll distance from touchdown.

33. ERROR IN NUMBER OF ENGINES

Severity: Fatal

Cause: Number of engines specified is zero or negative.

Correction: Set number of engines equal to the number of engines for the aircraft being considered.

34. NOTE: THIS NOISE CURVE IS NOT USED

Severity: Warning

Cause: A noise curve has been defined that is not used.

Correction: No correction is necessary.

35. ERROR IN NOISE CURVE NUMBER

Severity: Fatal

Cause: Noise curve set number not in range 1 to 41 or 101 to 150.

Correction: Correct noise curve number or delete the reference.

36. NOTE: REPLACEMENT OF A NOISE CURVE DOES NOT AFFECT THE CALCULATION OF TIME ABOVE

Severity: Warning

Cause: A data base noise curve has been replaced by a user defined noise curve.

Correction: None

37. *WARNING: NEW XX THRUST SETTING NOT WITHIN 20% OF ORIGINAL VALUE FOR NOISE CURVE XX.

Severity: Warning

Cause: Replacement thrust greatly different from data base thrust.

Correction: Check the data.

38. THRUSTS OR NOISE VALUES NOT IN PROPER ORDER

Severity: Fatal

Cause: Noise does not decrease as slant range increases or noise values do not decrease with thrust.

Correction: Correct the data.

39. EPNL + NEL THRUST VALUES MUST MATCH

Severity: Fatal

Cause: Corresponding thrusts are not equal.

Correction: Correct the data.

40. 2000 FLIGHT COMBINATIONS EXCEEDED

Severity: Fatal

Cause: Too many flights for internal storage allocations.

Correction: Try to delete insignificant tracks, insignificant numbers of operations and try to group several aircraft types into a single definition.

41. FATAL: AIRCRAFT XX NOT REQUESTED OR NOT DEFINED

Severity: Fatal

Cause: An aircraft mix record requests an aircraft not previously defined.

Correction: Correct mix data.

42. ONE OR MORE TRACKS NOT DEFINED

Severity: Fatal

Cause: A track has not been defined at a point in the sequence of a run and it is being referenced.

Correction: Define the track or correct the reference.

43. TRACK NUMBER IS MISSING

Severity: Fatal

Cause: In the direct assignment of mix data, the track number has not been specified.

Correction: Specify the track number or remove the assignment.

44. ABOVE TRACK IS NOT DEFINED

Severity: Fatal

Cause: A track number has been referenced and the track has not been defined.

Correction: Define the track or remove the reference.

45. PROFILE NOT PROPERLY DEFINED

Severity: Fatal

Cause: A profile has been referenced and has not been defined.

Correction: Define the profile or remove the reference.

46. THE AIRCRAFT ABOVE HAS BEEN ASSIGNED A TRIP LENGTH WHICH IS NOT COMMENSURATE WITH ITS MAXIMUM RANGE CAPABILITY

Severity: Warning

Cause: A profile number of zero was encountered in the aircraft definition for one of the trip length categories it has been assigned.

Correction: The program automatically assigns the profile defined for maximum range of the aircraft.

47. WARNING - RUNWAY LENGTH TOO SHORT FOR STAGE LENGTH XX ASSIGNMENT

Severity: Warning

Cause: The takeoff ground roll exceeds the length of the runway.

Correction: If true, put the aircraft on a runway that is long enough. If false, no action is necessary. The program will not take any action on its own.

48. PROFILE NOT IN STANDARD FORM

Severity: Fatal

Cause: A takeoff restriction has been requested and a profile numbered in the range 1 to 85 is not in standard form.

Correction: Remove the takeoff restriction or define the profile in standard form or remove the profile definition from the range 1 to 85.

49. <u>OVERRIDE VALUE ABOVE IN ERROR IN POSITION XX</u>

Severity: Fatal

Cause: Takeoff restriction override indicator for noise curve XX is not in the range 0 to 3.

Correction: Change it to the correct number.

50. <u>RESTRICTION XX IS INVALID</u>

Severity: Fatal

Cause: The end of a level flight cutback is specified as an altitude, or no gradient is specified for a "Type 5" restriction.

Correction: Specify end of cutback in terms of nautical miles from brake release. Specify the desired cutback gradient.

51. <u>*FATAL: NUMBER OF ENGINES CANNOT BE ZERO. CHECK APPROACH DATA</u>

Severity: Fatal

Cause: Zero engines defined on user approach parameter record.

Correction: Self-explanatory.

52. <u>*FATAL: THRUST VALUE FOR INDICATOR - 3, XX FOR AIRCRAFT XX AND APPROACH DATA XX IS NOT CLOSE TO REFERENCE THRUSTS IN NOISE CURVE XX</u>

Severity: Fatal

Cause: 3^{o} landing thrust not accpetable.

Correction: Correct thrust data.

53. *FATAL: DISCREPANCY IN NUMBER OF ENGINES FOR AIRCRAFT XX FOR PROFILE XX FOR APPROACH DATA XX

Severity: Fatal

Cause: Inconsistency in number of defined engines.

Correction: Correct the data.

The following are error messages output by the contour plotting package. In most cases the corrections necessary are clear. For others, operations or applications personnel at the computer facility should be consulted to determine both the cause and correction.

54. UNUSUAL END-OF-FILE

End-of-file encountered while attempting to read data items on contour tape.

55. END OF DATA REACHED BEFORE FILE N

User specified data file number N is beyond the range of contour tape file numbers or control card file numbers are not in ascending numerical order.

56. THE ABOVE CARD IS IN ERROR

Unrecognizable control card.

57. <u>ERROR TYPE J IN FILE N</u>

Tape error encountered processing file number N. The following values for J indicate error status:

J = 1 Inappropriate logical unit number.

J = 2 End of file or load point passed (when shipping records).

J = 3 Unrecoverable error.

58. <u>INCORRECT END OF FILE ON TAPE LU</u>

Edit error message indicating end of file encountered while attempting to read data items on logical unit LU.

6.0 INTERPRETING THE OUTPUT OF A CASE

The output of the INM consists of printed reports and contour plots. The grid analysis model produces a printed report of noise exposure at specific locations on the ground. The contour analysis model creates a report of ground locations with equal noise exposure. A file containing these coordinates is also produced for input to the contour plotting program which generates the actual contour plot.

The echo printing of input case data is common to both the grid and contour analysis. In addition, the models will print informative messages and intermediate calculations. These features provide the user with a quick means of detecting errors in the input data. Finally, the results of the model's computations are provided.

Figure 6.0-1 is essentially an echo of the various elements of the input case. Runway, track, aircraft, profile, approach and traffic mix data are shown. Figure 6.0-2 is a tabular presentation of the aircraft operations at the airport, as specified by the traffic mix data. Shown are the aircraft number and name, the noise curve set assignment number and the number of day-evening-night arrivals and departures by trip length. The first number on the first line in each of the trip length columns is the takeoff profile assignment for that trip length category.

```
FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO                                                                    08/06/79.
NEF
PRIMARY  1=NEF    FACTORS 88.0  1.0 16.7
ALTERNATES  *NONE*
-------------------------------------------------------------------
I     I          I          I          I CONTOUR I      I            I
I PNT I    X     I    Y     I   NEF    I  AREA   I FLTS I ITERATIONS I
I     I  COORD.  I  COORD.  IDECIBELS  I SQ. MI. I USED I            I
-------------------------------------------------------------------

1000  1  0.000        AIRPORT SECTION


                 AIRPORT ALTITUDE=     0. FT ABOVE MSL            AMBIENT TEMP= 15.DEG C

RUNWAY  1   10000.00        0.00        0.00        0.00        0.00        0.00  27  9 T.O. RWY 27          LENGTH = 10000.
RUNWAY  2       0.00        0.00        0.00    10000.00        0.00        0.00   9 27 T.O. RWY  9          LENGTH = 10000.
RUNWAY  3    7000.00    -7000.00        0.00     2000.00     2000.00        0.00  31 13 T.O. RWY 31          LENGTH = 10296.
RUNWAY  4    2000.00     2000.00        0.00     7000.00    -7000.00        0.00  13 31 T.O. RWY 13          LENGTH = 10296.
TRACK DATA  1 1 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  1 2 3    .50  45.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  3 3 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 4 5    .50  90.00  -1.50   1.50   0.00  45.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 5 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 6 3    .50  10.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 7 3    .50  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 8 3   1.00  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 9 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00

1070  0  0.000        AIRCRAFT SELECTION SECTION

THE FOLLOWING AIRCRAFT ARE RETRIEVED AS THEY APPEAR IN THE DATA BASE:
  3  5  8 43

1010  0  0.000        PROFILE SECTION

PROFILE 301 (N.M.)               STANDARD 3 DEGREE APPROACH
     -1.00       -.17       2.98       5.26      12.40      18.68       0.00       0.00       0.00       0.00
      0.00       0.00    1000.00    3000.00    4000.00    5000.00       0.00       0.00       0.00       0.00
     32.00      -2.00      -2.00      -2.00      -2.00      -2.00       0.00       0.00       0.00       0.00
    -10.00      -3.00      -6.00      -6.00      -6.00       0.00       0.00       0.00       0.00       0.00
PROFILE 302 (N.M.)               STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
     -1.00       -.17       2.98       5.26      12.00      15.14       0.00       0.00       0.00       0.00
      0.00       0.00    1000.00    3000.00    3000.00    4000.00       0.00       0.00       0.00       0.00
     32.00      -2.00      -2.00      -2.00      -2.00      -2.00       0.00       0.00       0.00       0.00
    -10.00      -3.00      -6.00      -5.00      -6.00       0.00       0.00       0.00       0.00       0.00
PROFILE 303 (N.M.)               GA. 3 DEGREE APPROACH
     -1.00       -.17       2.98       5.26      12.40      18.68       0.00       0.00       0.00       0.00
      0.00       0.00    1000.00    3000.00    4000.00    5000.00       0.00       0.00       0.00       0.00
     32.00      -2.00      -2.00      -2.00      -2.00      -2.00       0.00       0.00       0.00       0.00
     -3.00      -3.00      -3.00      -3.00      -3.00       0.00       0.00       0.00       0.00       0.00

1000  3  0.000        AIRCRAFT MIX SECTION

MIX DATA
                 .              .              .              .              .              .              .              .
  3  7   0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3  8   0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  0.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3  9 301  9.0  4.0  4.0  6.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  5  6 302  4.0  3.0  2.0  2.0  1.0  0.0  2.0  1.0  0.0  2.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  8  3 301 10.0  2.0  5.0  5.0  1.0  3.0  2.0  0.0  1.0  3.0  0.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 43  4   0  0.0  0.0  0.0 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 43  2 303 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
```

FIGURE 6.0.1. ECHOES OF RUNWAY, TRACK, AIRCRAFT SELECTIONS, PROFILES, AND AIRCRAFT MIX OUTPUT DATA

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO 08/06/79.

A/C	A/C NAME		NC		ARRIVALS		0- 500		500-1000		1000-1500		1500-2500		2500-3500		3500-4500		4500- UP
3		BAC-111	2	D	9.0	48	3.0	49	2.0	49	3.0	49	2.0	0	0.0	0	0.0	0	0.0
				E	4.0		1.0		1.5		1.0		0.0		0.0		0.0		0.0
				N	4.0		1.0		0.0		1.0		1.5		0.0		0.0		0.0
5	3E NHTF	727-200	6	D	4.0	18	2.0	20	2.0	20	2.0	20	0.0	0	0.0	0	0.0	0	0.0
				E	3.0		1.0		1.0		1.0		0.0		0.0		0.0		0.0
				N	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
8		707-120B	11	D	10.0	38	5.0	39	2.0	40	3.0	41	1.0	42	0.0	42	0.0	42	0.0
				E	2.0		1.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	5.0		3.0		1.0		1.0		0.0		0.0		0.0		0.0
43	MSEPA	GA	26	D	25.0	91	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
				E	5.0		5.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	10.0		10.0		0.0		0.0		0.0		0.0		0.0		0.0

FITURE 6.0-2. INTERPRETATION OF TRAFFIC MIX DATA

Figure 6.0-3 tabulates the runway utilization figures for both actual operations and as a percent of total operations. Also shown are the total takeoffs and landings and the total operations. The takeoff restriction data, if any, is also included in the printout.

6.1 GRID ANALYSES

Figure 6.1-1 is the standard tabular output produced by the grid analysis model. The grid point locations are listed in the column headed "INTERSECTION," with the first entry being the X-coordinate and the second entry the Y-coordinate. It should be noted that the grid point is expressed in an alphanumeric coordinate system for compatibility with the contour plots produced by the contour plotting model. The column headed "OFFSET" refers to an adjustment (in hundreds of feet) from the primary grid intersection. This adjustment is necessary to find the true location of the grid point used in the calculation. The first entry in the "OFFSET" column is the X-coordinate offset and the second entry is the Y-coordinate offset. The offset is found by locating the coordinates in the column labeled "INTERSECTION," then reading the X-coordinate offset (in hundreds of feet) to the east of that intersection and reading the Y-coordinate offset (in hundreds of feet) to the north. If no information is displayed in the OFFSET column, no offset is necessary. The "PERIOD" column dis-

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6

EXAMPLE AIRPORT SCENARIO

RUNWAY UTILIZATION

RUNWAYS-		27	9	31	13	TOT
TAKEOFFS (ACTUAL)	D	0.0	31.0	11.0	10.0	52.0
	E	0.0	8.0	1.0	3.5	12.5
	N	0.0	10.0	5.0	3.5	18.5
TAKEOFFS (PERCENT)	D	0.0	37.3	13.3	12.0	
	E	0.0	9.6	1.2	4.2	
	N	0.0	12.0	6.0	4.2	
LANDINGS (ACTUAL)	D	4.0	25.0	9.0	10.0	48.0
	E	3.0	5.0	4.0	2.0	14.0
	N	2.0	10.0	4.0	5.0	21.0
LANDINGS (PERCENT)	D	4.8	30.1	10.8	12.0	
	E	3.6	6.0	4.8	2.4	
	N	2.4	12.0	4.8	6.0	

TOTAL TAKEOFFS 83.0 LANDINGS 83.0

TOTAL OPERATIONS - DAILY 166. - YEARLY 60590.
DEFAULT RUNWAY 2 9

TOTAL FLIGHTS 14

00 0 0.000

CONTOUR

FIGURE 6.0-3. INM UTILIZATION TABLE

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6

EXAMPLE AIRPORT SCENARIO GRID ANALYSIS WITHOUT AIRCRAFT 101 07/30/79.

NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), AND TAKEOFF PROFILE(S).

INTER- SECTION	OFF SET	PERIOD	TIME IN MINUTES ABOVE INDICATED DBA LEVEL 65	75	85	95	105	115	LEQ	LDN	NEF	CNEL
0. [illegible]	.0..0	24 HOUR	74.8	31.0	12.0	2.7	.1	0.0	77.4	83.5	46.6	83.6
		EVENING	5.4	4.1	1.6	.2	0.0	0.0				
		NIGHT	17.1	6.8	2.7	1.0	.0	0.0				
1. [illegible]	.0..0	24 HOUR	81.2	37.5	16.7	3.7	.2	0.0	77.6	83.8	47.4	83.9
		EVENING	10.3	5.1	2.1	.2	0.0	0.0				
		NIGHT	15.7	8.1	3.9	1.1	.1	0.0				
0. C	.0..0	24 HOUR	60.7	34.1	5.8	1.3	0.0	0.0	72.3	77.7	42.2	77.9
		EVENING	7.8	4.5	.6	0.0	0.0	0.0				
		NIGHT	[illegible]	7.4	2.8	.7	0.0	0.0				
1. C	.0..0	24 HOUR	56.5	35.7	16.3	2.4	0.0	0.0	74.9	79.5	45.6	79.7
		EVENING	7.4	4.7	1.5	0.0	0.0	0.0				
		NIGHT	13.2	8.0	4.4	.7	0.0	0.0				
0. [illegible]	.0..0	24 HOUR	55.5	32.0	5.2	.3	0.0	0.0	71.0	75.2	41.7	75.4
		EVENING	7.6	3.8	.2	0.0	0.0	0.0				
		NIGHT	13.7	7.2	2.9	0.0	0.0	0.0				
1. [illegible]	.0..0	24 HOUR	56.0	30.4	11.6	2.2	0.0	0.0	75.2	79.0	47.8	79.2
		EVENING	7.1	3.5	.4	.1	0.0	0.0				
		NIGHT	[illegible]	7.0	3.6	.4	0.0	0.0				
0. [illegible]	.0..0	24 HOUR	55.7	27.1	5.8	.3	0.0	0.0	71.3	74.9	43.1	75.0
		EVENING	6.7	2.4	.3	.0	0.0	0.0				
		NIGHT	13.1	6.8	2.8	.0	0.0	0.0				
1. [illegible]	.0..0	24 HOUR	51.8	26.1	10.6	2.0	.4	0.0	77.5	81.7	51.4	82.0
		EVENING	6.2	2.3	.4	.1	.0	0.0				
		NIGHT	12.0	6.7	3.1	.4	.1	0.0				
0. [illegible]	.0..0	24 HOUR	49.4	24.5	8.5	1.4	0.0	0.0	73.6	77.6	47.3	77.8
		EVENING	5.4	1.8	.3	.1	0.0	0.0				
		NIGHT	12.0	6.5	2.2	.3	0.0	0.0				
1. [illegible]	.0..0	24 HOUR	51.5	23.4	8.8	.9	0.0	0.0	71.5	74.9	44.1	75.1
		EVENING	5.8	1.5	.3	.1	0.0	0.0				
		NIGHT	12.4	6.3	2.3	.2	0.0	0.0				

X-START	Y-START	X-STEP	Y-STEP	NX	NY	OPTIONS
0.00	1000.00	1000.	1000.	2	5	00000

FIGURE 6.1-1. STANDARD GRID ANALYSIS OUTPUT

plays the time period for which the calculations were performed and to which the entries in the next six columns apply. The next six columns contain the number of minutes that the TA threshold, indicated at the top of each column, was exceeded for the time period indicated. The next four columns contain the computed values for NEF, Ldn, CNEL and Leq.

Figure 6.1-2 represents the printer output when detailed information for each flight at each point is requested, giving each flight's contribution to the total noise exposure. Two lines of information are printed for each uniquely defined "flight". A flight is defined as a unique combination of the ordered triple (track number, profile number, noise curve set number). For this run there were 21 flights. The first line of the detailed output from using this option defines the point at which the analysis is performed. The second line contains abbreviated column headings. Following these are paired lines of information for each of the flights, the first line containing information corresponding to the column headings and the second providing noise value computation results.

Starting with the first line of the flight data in Figure 6.1-2 and proceeding from left to right, the first number is the flight number and the second is the track group assignment, followed by the track, profile, and noise curve set numbers. Under the column heading "MAXSEG" there are two numbers, the first

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                  FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
            EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101                07/30/79.

POINT. X=.0                 Y=.100000000E+04
FLT  G  TR PRF NC MAXSEG   C TO TRK      D ALONG TRK  (2ND.)          GRND ATTN ALTITUDE     THRUST      VELOCITY
  1  0  9 301  2   1  0  .7064832E+040.            0.                 -.6010E+010.          .800000E+04 .32000E+02
 3.73, 3.73  45.00,45.00  45.61,45.61  40.06,40.06   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  2  0  8  49  2   1  0  .2236068E+040.            0.                 -.4720E+010.          .122000E+05 .32000E+02
25.81,25.83  62.76,62.84  63.04,63.11  57.14,57.23   5.4,  5.44   2.8,  2.82   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  3  0  7  49  2   1  0  .2236068E+040.            0.                 -.4720E+010.          .122000E+05 .32000E+02
14.46,26.14  53.29,63.29  55.98,63.88  53.29,58.70   2.2,  7.68   1.2,  3.98   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  4  0  7  48  2   1  0  .2236068E+040.            0.                 -.4720E+010.          .122000E+05 .32000E+02
22.18,27.60  59.31,64.75  59.89,65.34  54.84,60.20   3.1, 10.82   1.6,  5.57   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  5  0  5 302  8   1  0  .6325545E+040.            0.                 -.6010E+010.          .800000E+04 .32000E+02
 9.36,27.67  42.22,64.78  43.09,65.37  37.45,60.22   0.0, 10.82   0.0,  5.57   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  6  0  6  20  8   1  0  .1000000E+040.            0.                 -.2010E+010.          .123000E+05 .32000E+02
28.71,31.23  66.66,68.83  68.87,70.48  66.66,67.55   4.0, 14.84   2.8,  8.38   1.8,  1.85   0.0,  0.00   0.0,  0.00   0.0,  0.00
  7  0  6  18  8   1  0  .1000000E+040.            0.                 -.2010E+010.          .150000E+05 .32000E+02
30.60,33.94  69.46,72.17  71.68,74.13  69.46,71.62   2.7, 17.50   1.5,  9.92   1.1,  2.91    .5,   .53   0.0,  0.00   0.0,  0.00
  8  0  4  91 26   1  0  .1000000E+040.            0.                 -.2010E+010.          .121350E+04 .32000E+02
20.63,34.14  53.93,72.23  54.25,74.17  48.81,71.64   8.4, 25.92   0.0,  9.92   0.0,  2.91   0.0,   .53   0.0,  0.00   0.0,  0.00
  9  0  3 301 20   1  0  .2233957E+04 .1039276E+050.                  -.1037E+02 .576386E+02 .440925E+04 .14600E+03
 -.83,34.14  36.85,72.23  36.85,74.17  36.85,71.64   2.5, 28.39   0.0,  9.92   0.0,  2.91   0.0,   .53   0.0,  0.00   0.0,  0.00
 10  0  3 301 11   1  0  .2233957E+04 .1039276E+050.                  -.1003E+02 .576386E+02 .389316E+04 .13500E+03
17.35,34.23  47.75,72.25  48.02,74.19  42.13,71.65   3.4, 31.82   0.0,  9.92   0.0,  2.91   0.0,   .53   0.0,  0.00   0.0,  0.00
 11  0  3  41 11   1  0  .2233957E+04 .1039276E+050.                  -.1871E+01 .492555E+03 .138100E+05 .17000E+03
14.95,34.28  45.34,72.26  45.34,74.19  45.34,71.66    .7, 32.54    .5, 10.38    .1,  2.97   0.0,   .53   0.0,  0.00   0.0,  0.00
 12  0  3  40 11   1  0  .2233957E+04 .1039276E+050.                  -.1470E+01 .747911E+03 .139000E+05 .16600E+03
28.04,35.20  56.64,72.37  56.64,74.27  51.52,71.70   2.7, 35.22   1.9, 12.27    .3,  3.23   0.0,   .53   0.0,  0.00   0.0,  0.00
 13  0  3  39 20   1  0  .2233957E+04 .1039276E+050.                  -.1252E+01 .894499E+03 .140000E+05 .16300E+03
19.51,35.32  56.91,72.50  56.91,74.35  56.91,71.84   1.3, 36.56    .7, 13.01    .4,  3.58   0.0,   .53   0.0,  0.00   0.0,  0.00
 14  0  3  39 11   1  0  .2233957E+04 .1039276E+050.                  -.1252E+01 .894499E+03 .140000E+05 .16300E+03
27.88,36.04  56.37,72.60  56.37,74.41  50.35,71.87   2.1, 38.70   1.3, 14.29    .2,  3.78   0.0,   .53   0.0,  0.00   0.0,  0.00
 15  0  3  38 20   1  0  .2233957E+04 .1039276E+050.                  -.8617E+00 .110890E+04 .141000E+05 .15500E+03
22.69,36.24  60.08,72.84  60.08,74.57  60.08,72.15   2.4, 41.14   1.7, 15.94    .7,  4.50   0.0,   .53   0.0,  0.00   0.0,  0.00
 16  0  3  38 11   1  0  .2233957E+04 .1039276E+050.                  -.8617E+00 .110890E+04 .141000E+05 .15500E+03
32.72,37.83  61.23,73.13  61.46,74.78  55.21,72.24   7.2, 48.32   3.4, 19.37    .6,  5.07   0.0,   .53   0.0,  0.00   0.0,  0.00
 17  0  3  28 20   1  0  .2233957E+04 .1039276E+050.                  -.1005E+01 .894499E+03 .152000E+05 .15400E+03
21.79,37.94  59.19,73.30  59.19,74.90  59.19,72.45   1.5, 49.87    .9, 20.23    .4,  5.51    .1,   .66   0.0,  0.00   0.0,  0.00
 18  0  2 303 26   1  0  .1000000E+04 .1000000E+050.                  -.4060E+01 .525478E+02 .486320E+03 .80000E+02
11.88,37.95  45.18,73.31  45.50,74.90  40.06,72.45   6.5, 56.39   0.0, 20.23   0.0,  5.51   0.0,   .66   0.0,  0.00   0.0,  0.00
 19  0  1 301 19   1  0  .1000000E+04 .1000000E+050.                  -.6790E+01 .525478E+02 .100192E+05 .15000E+03
26.88,38.28  64.93,73.90  65.85,75.41  61.66,72.80   7.6, 63.99   4.6, 24.87   2.4,  7.86   0.0,   .66   0.0,  0.00   0.0,  0.00
 20  0  1  31 19   1  0  .1000000E+04 .1000000E+050.                  -.1189E+01 .433333E+03 .152000E+05 .16300E+03
43.07,44.32  80.16,81.08  80.16,81.41  72.75,75.79   5.3, 69.24   3.1, 28.00   2.0,  9.88   1.0,  1.66    .1,   .09   0.0,  0.00
 21  0  1  29 19   1  0  .1000000E+04 .1000000E+050.                  -.7178E+00 .660897E+03 .152000E+05 .15800E+03
42.67,46.58  79.70,83.45  79.70,83.65  72.29,77.39   5.6, 74.81   3.0, 31.02   2.2, 12.03   1.1,  2.71   0.0,   .09   0.0,  0.00
```

FIGURE 6.1-2. GRID ANALYSIS OUTPUT, OPTION #4

being the segment number of the track at the point of closest approach to the grid point, and the second providing the segment number on the track which will be considered for secondary contributions to the noise level. The next two numbers in the first line are the distance to the track from the grid point and the distance from threshold along the track to the point of closest approach. The value under the column heading "2nd" is the distance along the track to the point at which the secondary segment, if any, most closely approaches the grid point. The last four values on the line are the attenuation correction in decibels, the aircraft altitude in feet, the thrust in pounds/engine, and the velocity in knots, respectively.

The second line of output for each flight contains ten ordered pairs of noise measure values. The first number of each pair is this flight's contribution to the noise measure and the second is the cumulative sum of the value of the noise measure up to and including this flight. Proceeding across the page from left to right the pairs of numbers represent values for NEF, Ldn, CNEL, Leq, and finally, TA values for the first, second, third, fourth, fifth, and sixth thresholds.

The information in Figure 6.1-3 results from requesting the contribution to the total noise value of each noise curve set. This tabular output identified the individual contributions to the noise measure levels at the grid point for each noise curve

CONTRIBUTION OF AIRCRAFT WITH ASSIGNED NOISE CURVES AT POINT X= 0.00, Y= 1000.00

NOISE CURVE ASSIGNMENTS

METRIC	2	8	11	19	20	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEF	27.6	32.8	35.1	45.9	26.3	21.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LDN	64.8	71.3	63.6	83.0	63.7	54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CNEL	65.3	73.5	63.8	83.0	63.7	54.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEQ	60.2	71.3	58.0	75.7	63.7	49.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T(X1) 24H	11.	7.	16.	18.	8.	15.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X1) E	2.	2.	1.	2.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X1) N	2.	0.	5.	6.	0.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) 24H	6.	4.	7.	11.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) E	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) N	1.	0.	2.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) 24H	0.	3.	1.	7.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) E	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) N	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) 24H	0.	1.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) N	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) 24H	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) 24H	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FIGURE 6.1-3. DETAILED GRID ANALYSIS OUTPUT, OPTION #3

set. The noise measurements are identified in the left hand column and the noise curve set numbers serve as the headings for the remaining columns. The designation "T(XI)" indicates time above threshold I.

6.2 CONTOUR

Figures 6.2-1 and 6.2-2 show examples of an abbreviated printed output of equal noise exposure values produced by the contour analysis program for NEF 30. In the standard printed output for the contour analysis the information in Figures 6.0-1 through 6.0-3 will precede the information in Figure 6.2-1.

Figure 6.0.0 is the program's interpretation of the contour process control information. The first two lines represent the run identification and title. The next seven lines are an annotated presentation of the program's interpretation of the contour specification data.

Figure 6.2-2 contains abbreviated tabular output for the contour analysis program. The run identification and title information are also provided. The first column of the table is the number of the contour point, the next two columns are the X- and Y-coordinate values for the contour point, and the fourth column is the value of the noise measure at the point. The next column contains a cumulative sum of the area within the contour (square statute miles) followed by two columns of diagnostic information

```
FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO

CONTOUR VALUE  30.00
TOLERANCE  .100
START POINT          0.00          0.00   AUTO-START
STEP SIZE       1165.00
STOP POINT        0.00          0.00
MAX. POINTS     250
ERROR CODE      0
```

FIGURE 6.2-1. INTERPRETATION OF THE CONTOUR PROCESSING DIRECTIONS

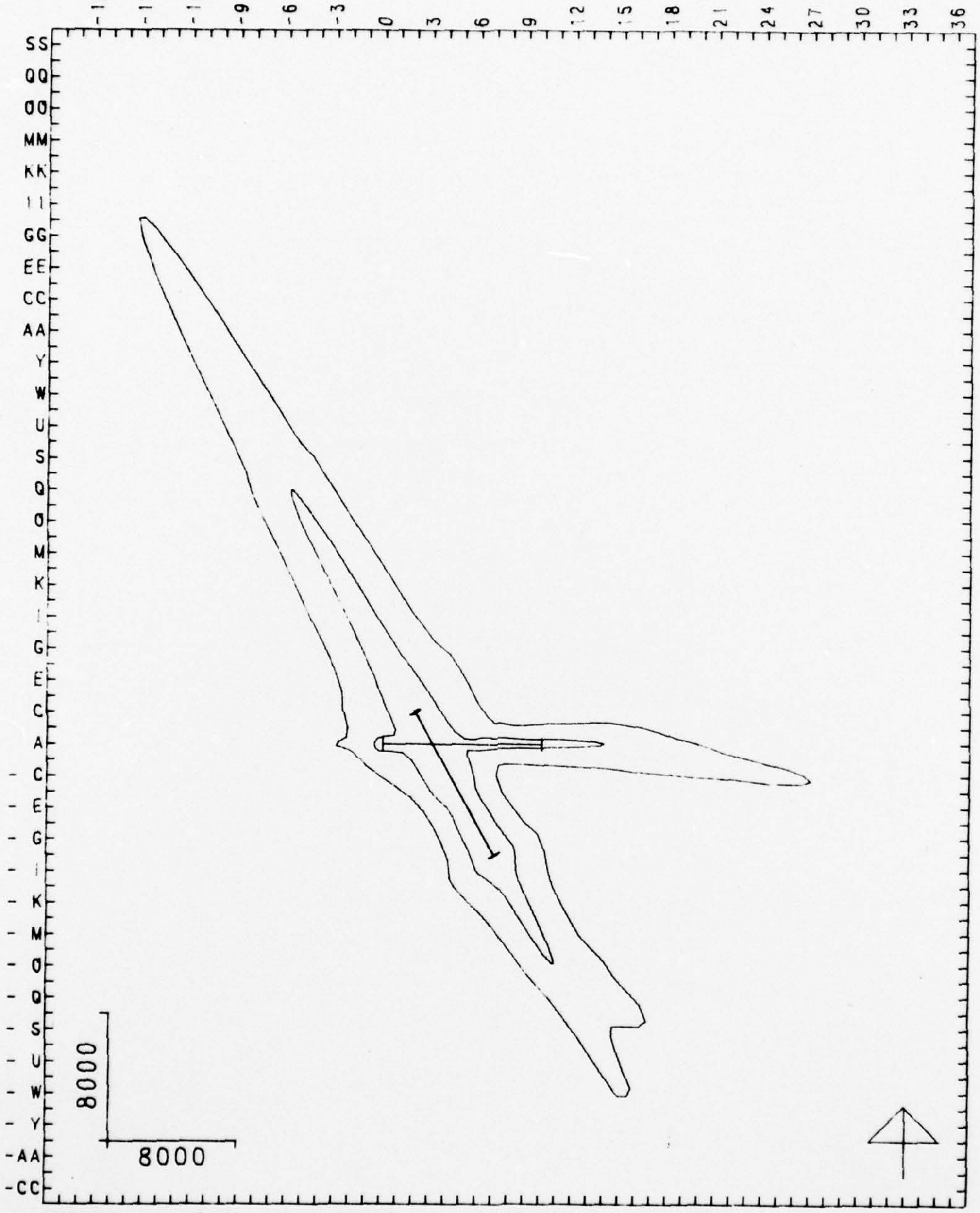
FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
1	19843.8	0.0	29.95	0.00	14	14
2	20938.2	-373.9	29.99	.13	14	7
3	22035.6	-735.0	30.01	.26	14	7
4	23169.1	-1004.0	29.99	.35	14	5
5	24301.0	-1280.0	29.96	.45	14	5
6	25429.6	-1569.0	29.92	.55	14	5
7	26522.6	-1950.1	30.06	.69	14	7
8	26907.2	-2391.9	30.05	.89	14	10
9	26327.8	-2488.5	30.10	.96	14	11
10	25162.8	-2477.0	29.94	1.00	14	5
11	24007.9	-2354.0	30.01	1.00	14	7
12	22848.6	-2239.2	29.98	1.00	14	5
13	21690.9	-2109.1	29.95	.99	14	5
14	20535.5	-2078.8	29.97	1.03	14	7
15	19382.2	-2014.7	29.97	1.04	14	7
16	18225.1	-1878.8	29.96	1.04	14	5
17	17068.9	-1788.2	29.99	1.05	14	7
18	15915.9	-1689.0	29.98	1.06	14	7
19	14759.9	-1544.4	29.97	1.05	14	5
20	13604.2	-1438.7	30.00	1.05	14	7
21	12440.3	-1388.1	30.01	1.07	14	5
22	11276.2	-1343.9	30.01	1.09	14	5
23	10111.7	-1308.5	30.10	1.11	14	5
24	8956.7	-1233.5	29.94	1.12	14	7
25	7803.4	-1258.2	29.94	1.16	14	7
26	7272.7	-1504.6	29.98	1.20	14	10
27	7163.6	-2076.8	30.06	1.28	14	10
28	7636.9	-3141.3	29.90	1.40	14	7
29	8270.4	-4108.3	29.97	1.49	14	7
30	9009.9	-4996.5	29.98	1.57	14	7
31	9877.5	-5774.0	29.95	1.62	14	5
32	10253.9	-6866.7	29.99	1.77	14	7
33	10467.7	-8007.2	29.99	1.96	14	7
34	10801.9	-9113.5	29.98	2.12	14	7
35	11298.9	-10160.8	29.99	2.24	14	7
36	11894.5	-11156.4	30.00	2.33	14	7
37	12502.2	-12139.1	29.99	2.42	14	7
38	13282.4	-12958.5	30.00	2.44	14	7
39	14092.7	-13835.5	29.99	2.45	14	5
40	14720.9	-14816.6	30.09	2.55	14	5
41	15543.0	-15632.2	30.00	2.54	14	7
42	16332.8	-16488.6	29.95	2.56	14	5
43	16796.1	-17557.6	30.00	2.74	14	7
44	16235.1	-17714.5	30.09	2.96	14	11
45	15080.0	-17724.8	30.01	3.33	14	7
46	14537.0	-17872.4	29.99	3.54	14	9
47	14492.9	-18439.6	29.96	3.70	14	11
48	14848.7	-19538.5	29.95	3.87	14	7
49	15273.7	-20623.2	30.06	4.01	14	5
50	15727.5	-21696.2	30.00	4.14	14	5

FIGURE 6.2-2. CONTOUR POINT LOCATION AND EXPOSURE VALUES

indicating the number of "noise-significant" flights used when searching for the next point on the contour and how many tries it took to find the point. It should be noted that the value in the noise measure column is related to the value N in the "FLTS USED" column. The value in the noise measure column, in this case the "NEF" column, represents the sum of the contributions from the N most significant flights at that point. Following the contour information a message informs the user of the position of the above contour information on the magnetic tape or disk file.

Figure 6.2-3 provides an example of an NEF contour. Note that the location of grid points identified in the "INTERSECTION" column of Figure 6.1-1 can be found on the contour plot. The alpha-numeric labeling surrounding the NEF contour correlates with the points computed in the grid analysis.



FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6

EXAMPLE AIRPORT SCENARIO
NEF 30.0 40.0

FIGURE 6.2-3. A SAMPLE NEF CONTOUR PLOT

7.0 MODIFYING AN EXISTING CASE (EDITING)

Many applications of INM involve the use of a basic set of airport and aircraft operations with subsequent changes of one or some input data elements. To facilitate the preparation of the modified cases an editing capability has been added to the INM Input Module. This capability permits the straightfoward preparation of a new case by using the original case with only the differences edited as desired. Thus a series of sensitivity analyses, for example, can be readily and effectively prepared and executed.

To make corrections or additions, name the new (edited) case and make up new data entry forms which show only the data to be changed or added. Be sure to use the correct identifying numbers for all entries. In this way, any part of the airport data file can be added or corrected.

No provision has been made to completely delete runways, tracks, or approach profiles. Airport traffic mix data can be deleted. Since the use of runways is based on ground tracks and the use of tracks and approach profiles is based on traffic mix data, deletion of appropriate traffic mix data will eliminate the use of undesired runways, ground tracks, and approach profiles.

Editing takeoff restrictions is done by writing the new restriction on an entry form. However, if any restriction over-

rides are to be changed, the entire set of correct override entries must be placed on the form.

Sort the coding sheets into

Runways

Tracks

Optional aircraft definitions

Optional takeoff profiles

Approach profiles

Optional approach parameters

Optional noise curve data

Traffic mix data

Take-off modifications

and sort each section by identifying number.

Log into the system and select the EDIT function.

The user will have the opportunity to edit or review any section (runway, profile, etc.). Within each section, the user will have access to a few entries at a time. All work on these entries must be completed before any work is done on the next entries.

The Edit Mode will prompt the user until a desired function is reached. The user must make the editing changes in the order they are called for in the file. For example, runways must be edited in numerical order and ground track changes cannot be made until runway editing has been completed.

To edit an entry, enter its identifying number when asked

WHICH ENTRY DO YOU WISH TO EDIT?

It is possible to add entries by responding with a number higher than any entry. If the number of entries made exceeds the computer's temporary holding capacity, the user will be asked to approve the entries made and then be permitted to add the rest of the entries.

Data entries are made in the same manner as in creating an airport data file.

7.1 EDITING RUNWAYS

The user should have runway data sheets prepared which contain the correct data for each runway that is to be edited or added to. Average ambient temperature and airport altitude may also be changed.

The user will be asked

DO YOU WANT TO REVIEW OR EDIT ALTITUDE, TEMPERATURE OR RUNWAY DATA?

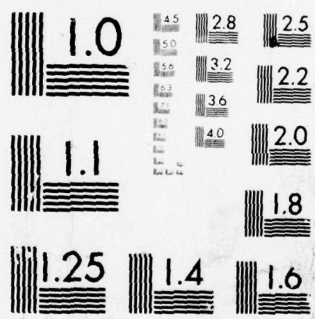
Any response starting with "Y" will permit the user to edit this data. Any other response will copy the old altitude, temperature, and runway data to the new file and go on to track editing.

The user will then be asked

DO YOU WISH TO REPLACE ALL THE RUNWAYS?

AD-A079 493 FEDERAL AVIATION ADMINISTRATION WASHINGTON DC OFFICE --ETC F/G 1/2
INTEGRATED NOISE MODEL (INM). VERSION 2. USER'S GUIDE,(U)
SEP 79 T CONNOR, R HINCKLEY
UNCLASSIFIED FAA-AEE-79-09 NL

3 OF 5
AD
A079493



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Any response starting with a "Y" will cause all of the old altitude, temperature, and runway data to be deleted and the user will be asked to replace it. If this is done, refer to Section 4.2.1 for instructions. When finished, the Input Module will re-enter edit mode starting with track editing.

Any other response will preserve all the altitude, temperature, and runway data that the user does not specifically alter. First the altitude and temperature data is displayed for approval.

```
ALTITUDE:          0.  TEMPERATURE:       15.
ARE ENTRIES CORRECT (Y/N)?
```

Approve the data unless it is to be changed. If it is not approved, both an altitude and a temperature entry must be made. Either (or both) entries may be identical to the entry being replaced.

The user will be given the chance to review and/or edit the runways in groups of five (1 to 5, 6 to 10, etc.), by responding to

```
DO YOU WISH TO REVIEW RUNWAYS 1 TO 5?
```

Any response starting with an "N" (i.e., NO) will result in the group being copied, unchanged, to the new file. The user may then review/edit the next group of five.

Any other response will result in the query

```
REVIEW?
```

If the response starts with "Y", the runways in the above

group will be displayed for the user.

The next query is

EDIT?

If the response starts with "Y", the user will have the opportunity to edit the runways in the group. Otherwise the program will go on to the next group.

If the user chooses to edit the group, the next query is

ENTER THE NUMBER OF ANY INCORRECT RUNWAY,

ENTER 0 IF ALL ARE CORRECT:

The user then enters the number of any runway in the group which is to be changed. Only runways in the group can be changed. A runway can be changed more than once (e.g., in the case of an error made in typing the correction). When all the corrections have been made, enter a "0". The program will copy the group, as corrected, to the new file and go on to the next group.

Any runway that is being edited must be completely replaced. See Section 4.2.1 for details. The "REV" function still works, but remember that the coordinates of the runway will be the reverse of the previous runway in the group, not the last runway edited.

The user can add more runways (although the total of new and old runways may not exceed 15). To do so, edit the last group and enter a runway number that is one greater than the last runway in the group. That runway is then entered. The last group may, as a result, have more than 5 runways in it. Be sure to

enter the new runways in order. For example, an old airport data file contains 10 runways and the user wishes to add two runways (11 and 12) without changing the old runways. User responses are underlined. The first group (runways 1 to 5) is not edited:

DO YOU WISH TO REVIEW OR EDIT RUNWAYS 1 TO 5?

<u>NO</u>

DO YOU WISH TO REVIEW OR EDIT RUNWAYS 6 TO 10?

<u>YES</u>

REVIEW?

<u>NO</u>

EDIT?

<u>YES</u>

When asked to enter the number of the runway to be edited, enter "11".

ENTER THE NUMBER OF ANY INCORRECT RUNWAY,...

<u>11</u>

Then the runway data is entered. After that runway 12 is entered.

7.2 EDITING TRACKS

In the edit mode the user may replace all the tracks or review any tracks and replace selected tracks. After performing any desired editing of runway data, the program will ask

DO YOU WANT TO REVIEW OR EDIT TRACKS?/

Any response starting with "N" (i.e., NO) will result in the

unedited tracks being copied to the edited airport data file. Editing then goes on to optional aircraft definitions.

Any other response will result in the query

DO YOU WISH TO REPLACE ALL THE TRACKS?

Any answer starting with "Y" (i.e., YES) will result in all of the previous tracks being deleted, and only the new tracks will appear in the edited airport data. See Section 4.2.2 for instructions.

Any other response will result in the user being given the opportunity to review or edit the tracks in groups of five. New tracks may be added after all of the old tracks have been reviewed or edited.

For each group the program will query

DO YOU WISH TO REVIEW OR EDIT TRACKS 1 TO 5?

Any answer starting with "N" (i.e., NO) will result in the group being copied, unchanged, to the edited data file. Then the next group will be presented.

Any other answer will result in the query

REVIEW?

Any answer starting with "Y" (i.e., YES) will have the tracks displayed to the user.

```
REVIEW?
Y

RW  TK  SG  DT1  DT2   RD2  DT3  RD3  DT4  RD4  DT5  RD5  DT6  RD6  DT7  RD7  DT8
 1   1   1  50.
 1   2   3   .5  45.   1.5  50.
 3   3   1  50.
 2   4   5   .5  90.  -1.5  1.5   0.  45.  -1.5 50.
 2   5   1  50.
EDIT?
```

The program will then query

EDIT?

Any answer which does not begin with a "Y" (i.e., NO) will result in the group of tracks being copied, unchanged, to the new airport data file.

If the answer starts with a "Y" (i.e., YES), the user may change any tracks in the group

ENTER THE NUMBER OF ANY INCORRECT TRACK, ENTER 0 IF TRACKS ARE CORRECT:

The user may respond with the number of any track in the group. The user will then replace this track completely (See Section 4.2.2.) When all the tracks in the group are correct, enter a "0" and the edited tracks will be added to the airport data file. Then the user will be presented with the next group of tracks.

The user may add new tracks to the last group of tracks. The new tracks will be numbered sequentially following the previous tracks. To do this, when asked to enter the number of the track to be edited, enter the number of the new track being added. Be

sure to enter the ground tracks in the order they are to be numbered.

ENTER THE NUMBER OF ANY INCORRECT TRACK, ENTER 0 IF TRACKS ARE CORRECT:
11

APPROVE ENTERED GROUND TRACKS MORE WILL BE ADDED
ENTER THE NUMBER OF ANY INCORRECT TRACK, ENTER 0 IF TRACKS ARE CORRECT:
0

WHICH RUNWAY (USE THE NUMBER) DOES TRACK 11 START ON?

If the additional tracks fill the current group and the user attempts to add more, this message appears:

APPROVE ENTERED TRACKS AND MORE WILL BE ADDED:

When all the tracks in the current group are correct, enter a "0". The program will then create another group and the user may continue adding tracks.

When all additions have been made and checked, enter a "0" and the program will go on to optional aircraft definitions.

7.3 EDITING ALTERNATIVE AIRCRAFT TYPES

The user may review, change, add, or delete alternative aircraft definitions. Previously entered definitions are reviewed or edited in groups of five. When all of the previously entered definitions have been entered, new aircraft definitions may be added.

Data for aircraft definitions to be changed or added should be entered on Aircraft Data Definition Sheets. When the edit mode of the INM Input Module reaches alternative aircraft types

and there are some in the old airport data file, it will query:

DO YOU WANT TO REVIEW OR EDIT ALTERNATIVE AIRPLANE DEFINITIONS (Y/N)?

If the user's response starts with "N" (i.e., NO), previously created airplane definitions are copied, unchanged to the newly created airport data file.

If the user's reponse starts with "Y" (i.e., YES), the program will query

DO YOU WANT TO REPLACE ALL THE AIRPLANE DEFINITIONS (Y/N)?

If there are no alternative aircraft definitions in the old airport data file or the user's response to the above question starts with a "Y" (i.e., YES), the user will be given a chance to enter aircraft definitions. The program will proceed as explained in Section 4.2.3.

If the user's response to the above question starts with an "N" (i.e., NO), the user will be given the chance to review or edit the alternative aircraft definitions in groups of five.

DO YOU WISH TO REVIEW OR EDIT AIRCRAFT DEFINITIONS 1 TO 5 (Y/N)?

If the user's response starts with "N" (i.e., NO), the group will be copied unchanged to the new airport data file and the Input Module will go on to the next group.

If the user's response starts with a "Y" (i.e., YES), the program will query:

REVIEW?

If the user's response starts with a "Y" (i.e., YES), the group of aircraft definitions will be displayed on the user's terminal.

REVIEW?
Y

#	NAME	NOISE CURVE	APPR PROF	TAKEOFF 1	2	PROFILES FOR TRIP LENGTHS 3	4	5	6	7
17	AIRCRAFT X	19	101	27	28	29	30	31	32	32
101	AIRCRAFT Y	101	102	201	201	202	202	0	0	0
102	AIRCRAFT Z	20	18	38	28	39	29	0	0	0

Then the program will query

EDIT?

If the user's response starts with an "N" (i.e., NO), the group of aircraft definitions will be copied, unchanged, to the new airport data file. The program will then go on to the next group.

If the user's response starts with a "Y" (i.e., YES), the user will have a chance to delete unwanted definitions, in the group:

ENTER THE NUMBER OF ANY AIRCRAFT TYPE ENTRY THAT IS TO BE DELETED. ENTER 0 WHEN FINISHED.

Enter the aircraft type number of any definition that is to be deleted. It will not be copied to the new airport data file.

If no aircraft definitions are to be deleted, or when all the unwanted definitions have been deleted, enter a "0" and the pro-

gram will go on to permit the user to edit definitions in the group without deleting them.

Correcting entries is done as explained in Section 4.2.3 after the query

ENTER THE NUMBER OF ANY INCORRECT AIRCRAFT, ENTER 0 IF ALL ARE CORRECT:

The user may add new aircraft type definitions after the previously created aircraft definitions.

Edit the last group of aircraft definitions. Once any needed corrections have been made, enter the number of the first aircraft type to be added.

```
ENTER THE NUMBER OF ANY INCORRECT AIRCRAFT ENTER 0 IF ALL ARE
CORRECT:
105

DO YOU WISH TO ADD THIS AIRCRAFT TYPE (Y/N)?
Y

APPROVE CURRENT ENTRIES AND MORE WILL BE ADDED.
ENTER THE NUMBER OF ANY INCORRECT AIRCRAFT ENTER 0 IF ALL ARE
CORRECT:
0

AIRCRAFT TYPE NUMBER:
105
AIRCRAFT NAME:
```

If the group becomes filled, the program will respond

APPROVE CURRENT ENTRIES AND MORE WILL BE ADDED:

Finish correcting the current group and another will be started.

7.4 EDITING TAKEOFF PROFILES

In the Edit Mode, the user may replace all profiles or review and edit selected takeoff profiles. After performing desired editing of alternate aircraft definitions, the program will ask

DO YOU WANT TO REVIEW OR EDIT TAKEOFF PROFILES?

Any response starting with an "N" (i.e., NO) will result in the previously created takeoff profiles being copied, unchanged, to the edited airport data file. The user is then asked about editing approach profiles.

Any other response will result in

DO YOU WISH TO REPLACE ALL TAKEOFF PROFILES?

If the response starts with an "N" (i.e., NO), the program will delete all the previously entered takeoff profiles and the user may enter new takeoff profiles. The program will proceed as explained in Section 4.2.4.

Any other response will give the user the opportunity to review, edit, or delete the takeoff profiles in groups of five. New takeoff profiles can be added after all the old profiles have been edited.

For each group of 5 takeoff profiles the program will ask

DO YOU WISH TO REVIEW OR EDIT PROFILES IN GROUP?

The user should refer to a listing of the data file being edited or review every group to keep track of which profiles are in the group. If the response starts with an "N" (i.e., NO) the

group will be copied, unchanged, to the airport data file and the next group will be presented.

Any other answer will result in the query

REVIEW?

Any response starting with a "Y" (i.e., YES) will cause the group to be displayed to the user. The program will then ask

EDIT?

Any answer which does not start with a "Y" (i.e., NO) will result in the group being copied, unchanged, to the new airport data file. If the answer starts with a "Y" (i.e., YES) the program will query:

ENTER THE NUMBER OF ANY ENTRY IN THE GROUP THAT IS TO BE DELETED. ENTER 0 WHEN FINISHED:

If any entry is to be deleted, enter its number. The profile will not be copied to the new airport data file. When all unwanted profiles have been deleted, the program will query:

ENTER THE NUMBER OF ANY INCORRECT PROFILE, ENTER 0 IF ALL ARE CORRECT:

The user may respond with the number of any takeoff profile in the group. The user will then edit this profile (see Section 4.2.4). When all the profiles in the group are correct, enter a "0" and the edited profiles will be added to the new airport data file. A profile may be edited more than once as long as the user is still editing its group. Then the user will be presented

with the next group of takeoff profiles.

The user may add new takeoff profiles to the last group of profiles. To do this, wait until the last group is being edited. When asked to enter the number of the profile to be edited, enter the number of the profile being added. In the example below, user reponses are underlined.

> ENTER THE NUMBER OF ANY INCORRECT PROFILE, ENTER 0 IF
> ALL ARE CORRECT: 6
>
> APPROVE ENTERED PROFILES AND MORE WILL BE ADDED
>
> ENTER THE NUMBER OF ANY INCORRECT PROFILE, ENTER 0
> IF ALL ARE CORRECT: 0
>
> TAKEOFF PROFILE 6
>
> ENTER THE PROFILE LABEL

If the additional takeoff profiles fill the current group and the user attempts to add more, this message appears.

> APPROVE ENTERED PROFILES AND MORE WILL BE ADDED:

When all the takeoff profiles in the current group are correct, enter a "0". The program will then create another group and the user may continue adding takeoff profiles.

When all additions have been made and checked, enter a "0" and the program will go on to approach profile data.

7.5 EDITING APPROACH PROFILES

In the edit mode, the user may replace all profiles or review and edit selected approach profiles. After performing any desired editing of optional takeoff profiles, the program will

ask

DO YOU WANT TO REVIEW OR EDIT PROFILES?

Any response starting with an "N" (i.e., NO) will result in the previously created approach profiles being copied, unchanged, to the edited airport data file. The user is then asked about editing optional noise curve data.

Any other response will result in the query

DO YOU WISH TO REPLACE ALL THE PROFILES?

Any answer starting with a "Y" (i.e., YES) will result in the deletion of all the previously created approach profiles. The user will then be asked to enter a new set of approach profiles (See Section 4.2.5).

Any other response will result in the user being given the opportunity to review or edit the approach profiles in groups of five. New approach profiles may be added after all of the old profiles have been reviewed or edited.

For each group the program will query

DO YOU WISH TO REVIEW OR EDIT PROFILES 1 TO 5?

Any answer starting with an "N" (i.e., NO) will result in the group being copied, unchanged, to the edited airport data file, then the next group will be presented.

Any other answer will result in the query:

REVIEW?

Any answer starting with a "Y" (i.e., YES) will cause the

group of approach profiles to be displayed to the user.

```
DO YOU WISH TO REVIEW OR EDIT PROFILES 1 to 3?
YES

REVIEW?
Y

PROFILE 1 STANDARD 3 DEGREE APPROACH
SEGMENT DISTANCE   HEIGHT   SPEED   THRUST
  1         STOP       0.     32.   -10.0
  2        -.165       0.    LAND     -3.
  3        2.975    1000.    LAND     -6.
  4        9.255    3000.    LAND     -6.
  5       12.395    4000.    LAND     -6.
  6       18.675    5000.    LAND
PROFILE 2 STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
SEGMENT DISTANCE   HEIGHT   SPEED   THRUST
  1         STOP       0.     32.   -10.0
  2        -.165       0.    LAND     -3.
  3        2.975    1000.    LAND     -6.
  4        9.255    3000.    LAND     -5.
  5          12.    3000.    LAND     -6.
  6        15.14    4000.     -2.
PROFILE 3 GA. 3 DEGREE APPROACH
SEGMENT DISTANCE   HEIGHT   SPEED   THRUST
  1         STOP       0.     32.   -10.0
  2        -.165       0.    LAND     -3.
  3        2.975    1000.    LAND     -3.
  4        9.255    3000.    LAND     -3.
  5       12.395    4000.    LAND     -3.
  6       18.675    5000.    LAND
EDIT?
```

The program will then ask

EDIT?

Any answer which does not start with a "Y" (i.e., NO) will result in the group of approach profiles being copied, unchanged, to the new airport data file and the program will continue.

If the answer starts with a "Y" (i.e., YES), the user may change any approach profiles in the group.

ENTER THE NUMBER OF ANY INCORRECT PROFILE, ENTER 0
IF ALL ARE CORRECT:

The user may respond with the number of any approach profile in the group. The user will then edit this profile (See Section 4.3.5). When all the profiles in the group are correct enter a "0" and the edited profiles will be added to the new airport data file. A profile may be edited more than once as long as the user is still editing its group. Then the user will be presented with the next group of approach profiles.

The user may add new approach profiles to the last group of profiles. The new approach profiles will be numbered sequentially following the last of the previously created approach profiles. To do this, when asked to enter the number of the next profile to be edited, enter the number of the profile being added. Be sure to enter the additional profiles in the order in which they are to be numbered.

```
ENTER THE NUMBER OF ANY INCORRECT PROFILE, ENTER 0 IF ALL ARE
CORRECT:
6

APPROVE ENTERED PROFILES AND MORE WILL BE ADDED
ENTER THE NUMBER OF ANY INCORRECT PROFILE, ENTER 0 IF ALL ARE
CORRECT:
0

APPROACH PROFILE 6
ENTER THE PROFILE LABEL
```

If the additional approach profiles fill the current group and the user attempts to add more, this message appears

APPROVE ENTERED PROFILES AND MORE WILL BE ADDED:

When all the approach profiles in the current group are correct, enter a "0". The program will then create another group and the user may continue adding approach profiles.

When all additions have been made and checked, enter a "0" and the program will go on to optional noise curve data.

7.6 EDITING APPROACH PARAMETER DATA

The user may review, change, delete, or add to the approach parameter data. When using the edit mode, the program will ask

DO YOU WANT TO REVIEW OR EDIT APPROACH PARAMETER DATA (Y/N)?

If the response starts with an "N" (i.e., NO), the approach parameter data will be copied, unchanged, to the new airport data file.

Any other response will result in the query

DO YOU WANT TO REPLACE ALL THE APPROACH PARAMETERS (Y/N)?

Any response starting with a "Y" (i.e., YES) will result in the user being asked to enter new approach parameter data (see Section 4.3.6). None of the data from the old airport data file will be added to the new airport data file.

Any other response will give the user the opportunity to review, delete, or edit the previously entered approach parameter data in groups of five.

DO YOU WISH TO REVIEW OR EDIT APPROACH PARAMETERS
1 to 5 (Y/N)?

The numbers are only the order of entry not the approach parameter number. Any response starting with an "N" (i.e., NO) will result in the group being copied, unchanged, to the new airport data file. The program will then go on to the next group.

Any other response will result in the query

REVIEW?

Any response starting with a "Y" (i.e., YES) will result in the group of approach parameters being displayed on the user's terminal.

EDIT?

Any response starting with an "N" (i.e., NO) will result in the group being copied, unchanged, to the new airport data file. The program will then go on to the next group.

Any other response will result in the query

ENTER THE APPROACH PARAMETER NUMBER OF ANY ENTRY THAT
IS TO BE DELETED.

ENTER 0 WHEN FINISHED.

If the user does not wish to erase any entries in the group or after all unwanted entries have been erased, enter a "0". Enter the approach parameter number of any entry in the group that is to be deleted. That entry will not be copied to the new airport data file. Do not delete an entry that you wish to correct.

The next query will be

ENTER THE NUMBER OF ANY INCORRECT PARAMETER ENTER 0
IF ALL ARE CORRECT:

To edit each entry, proceed as explained in Section 4.2.6 after this query. When all the entries are correct enter a "0" and the corrected group of approach parameter data will be copied to the new airport data file.

The user may add entries when all of the previous entries have been entered. See Section 4.2.6 for details.

7.7 EDITING NOISE CURVE DATA

The user may add, delete, change, or review noise curve data. If no optional noise curve data was in the previous airport data file, the user will be given the opportunity to add noise curve data. See Section 3.1.7.

If there is already optional noise curve data in the previously created airport data file, it will query

DO YOU WANT TO REVIEW OR EDIT ALTERNATIVE NOISE CURVE
DATA (Y/N)?

If the response starts with an "N" (ie., NO), the previously created noise curve data set is copied, unchanged, to the new airport data file. Any other response will give the user the chance to edit the noise curve data.

The program will query

DO YOU WISH TO REPLACE ALL THE ALTERNATE NOISE CURVE DATA (Y/N)?

If the response starts with a "Y" (i.e., YES), the previously created noise curve data sets will be deleted and the user will be asked to enter any desired noise curve data as explained in Section 3.1.7.

The user will then be given a chance to review, delete, or change each user-defined noise curve data set. The program will ask

DO YOU WISH TO REVIEW/EDIT NOISE CURVE 101 (Y/N)?

If the response starts with an "N" (i.e., NO), the noise curve data set will be copied to the new airport data file, unchanged, and the program will go on to the next noise curve data set.

Any other response will result in the query

REVIEW?

Any response starting with a "Y" (i.e., YES) will cause the noise curve data set to be displayed on the terminal.

```
101                  TABLES FOR AIRCRAFT Y
#   THRUST FEET:200   400   600   1000   2000   4000   6000  10000
EPNL
1   30000.     105.  100.   95.    90.    85.    80.    75.    70.
2   20000.     100.   95.   90.    85.    80.    75.    70.    65.
3   10000.      95.   90.   85.    80.    75.    70.    65.    60.
NEL
1   30000.     100.   95.   90.    85.    80.    75.    70.    65.
2   20000.      95.   90.   85.    80.    75.    70.    65.    60.
3   10000.      90.   85.   80.    75.    70.    65.    60.    55.
```

The next query will be

EDIT?

If the response starts with an "N" (i.e., NO), the noise curve data set will be copied, unchanged, to the new airport data file and the program will go on to the next noise curve data set.

Any other response will result in the query

DO YOU WISH TO DELETE NOISE CURVE NUMBER 101?

If the response starts with a "Y" (i.e., YES), the noise curve data set will be deleted and the program will go on to the next noise curve data set.

Any other response will give the user the opportunity to change the noise curve data set as explained in Section 3.1.7 after "AT THE TERMINAL".

When all the noise curve data has been edited, the program will query

DO YOU WISH TO ADD ANOTHER NOISE CURVE DATA SET?

If the response starts with a "Y" (i.e., YES), the user may add more noise curve data sets as explained in Section 3.1.7, after "At The Terminal."

Any other response will cause the program to go on to the next Mix Section.

7.8 EDITING TRAFFIC MIX DATA

In the edit mode, the user may replace all traffic mix data or review, delete, and edit selected entries. After performing

any desired editing of optional noise curve data, the program will ask

DO YOU WANT TO REVIEW OR EDIT TRAFFIC MIX DATA?

Any response starting with an "N" (i.e., NO) will result in the previously created traffic mix data being copied, unchanged, to the edited airport data file. The user is then asked about editing takeoff restrictions.

Any other response will result in the query

DO YOU WISH TO REPLACE ALL THE TRAFFIC ENTRIES?

Any answer starting with a "Y" (i.e., YES) will result in the deletion of all the previously created traffic mix data. The user will then be asked to enter a new set of traffic mix data (see Section 4.2.8).

Any other response will result in the user being given the opportunity to review or edit the traffic mix entries in groups of ten. New traffic mix entries may be added after all of the old entries have been reviewed or edited. Previously entered data may be deleted.

For each group the program will query

DO YOU WISH TO REVIEW OR EDIT ENTRIES 1 TO 5?

Any answer starting with an "N" (i.e., NO) will result in the group being copied, unchanged, to the edited airport data file, then the next group will be presented.

Any other answer will result in the query

REVIEW?

Any answer starting with "Y" (i.e., YES) will have have the trafic mix data displayed to the user.

DO YOU WISH TO REVIEW OR EDIT ENTRIES 1 TO 10?
<u>YES</u>

REVIEW?
<u>Y</u>

```
 1 AIRCRAFT:    BAC  111  TRACK:   7 PROFILE:    0 ARRIVALS DAY:  0. EVN:  0. NIGHT:  0.
DEPARTURES   RANGE   DAY  EVN NGT    RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500    3.   1.  1.  500-1000    2.  1.5       1000-1500
 2 AIRCRAFT:    BAC  111  TRACK:   8 PROFILE:    0 ARRIVALS DAY:  0. EVN:  0. NIGHT:  0.
DEPARTURES   RANGE   DAY  EVN NGT    RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500    0.   0.  0.  500-1000    0.   0.   0. 1000-1500     3.  1.  1.
         1500-2500    2.   0. 1.5 2500-3500                  3500-4500
 3 AIRCRAFT:    BAC  111  TRACK:   9 PROFILE:  301 ARRIVALS DAY:  9. EVN:  4. NIGHT:  4.
 4 AIRCRAFT:    727  200  TRACK:   6 PROFILE:  302 ARRIVALS DAY:  4: EVN:  3: NIGHT:  2.
DEPARTURES   RANGE   DAY  EVN NGT    RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500    2.   1.  0.  500-1000    2.   1.   0. 1000-1500     2.  1.
 5 AIRCRAFT:    707 120B  TRACK:   3 PROFILE:  301 ARRIVALS DAY: 10. EVN:  3. NIGHT:  5.
DEPARTURES   RANGE   DAY  EVN NGT    RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500    5.   1.  3.  500-1000    2.   0.   1. 1000-1500     3.  0.  1.
         1500-2500    1.          2500-3500                  3500-4500
 6 AIRCRAFT:     VC   10  TRACK:   4 PROFILE:  301 ARRIVALS DAY:  5. EVN:  2. NIGHT:  1.
DEPARTURES   RANGE   DAY  EVN NGT    RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500    0.   0.  0.  500-1000    0.   0.   0. 1000-1500     2.  0.  2.
         1500-2500    0.   0.  0. 2500-3500    2.   0.   2. 3500-4500
 7 AIRCRAFT:      MSEP6   TRACK:   4 PROFILE:    0 ARRIVALS DAY:  0. EVN:  5. NIGHT: 10.
DEPARTURES   RANGE  DAY  EVN NGT     RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500  25.   5. 10.   500-1000                  1000-1500
 8 AIRCRAFT:      MSEP6   TRACK:   2 PROFILE   303 ARRIVALS DAY: 25. EVN:  5. NIGHT: 10.
 9 AIRCRAFT:              TRACK:   5 PROFILE:  302 ARRIVALS DAY:  8: EVN:  1. NIGHT:  1.
DEPARTURES   RANGE   DAY  EVN NGT    RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500    0.   0.  0.  500-1000                  1000-1500
10 AIRCRAFT:              TRACK:   3 PROFILE:  301 ARRIVALS DAY:  4. EVN:  0. NIGHT:  0.
DEPARTURES   RANGE   DAY  EVN NGT    RANGE     DAY  EVN  NGT   RANGE     DAY EVN NGT
             0-500    2.   0.  0.  500-1000    1.   0.   0. 1000-1500     1.
EDIT?
```

The program will then ask

EDIT?

Any answer which does not start with an "N" (i.e., NO) will result in the group of traffic mix entries being copied, unchanged, to the new airport data file.

If the answer starts with a "Y" (i.e., YES), the user will be asked to

ENTER THE NUMBER OF ANY ENTRY FROM 1 TO 10 THAT IS TO BE DELETED

ENTER 0 WHEN FINISHED.

If any entry is to be deleted, enter its number. This entry will not be copied to the new airport data file. The new airport data file will not have the same numbering scheme for traffic mix data but the numbering in the file being edited will be unaffected.

ENTER THE NUMBER OF ANY INCORRECT ENTRY, ENTER 0 IF ALL ARE CORRECT:

The user may respond with the number of any entry in the group. The user will then edit this entry (see Section 4.2.8). When all the entries in the group are correct enter a "0" and the edited entries will be added to the new airport data file. An entry may be edited more than once as long as the user is still editing its group. Then the user will be presented with the next group of traffic mix data.

The user may add new traffic mix data entries to the last group of entries. The new traffic mix data entries will be numbered sequentially following the last of the previously created entries. To do this, when asked to enter the number of the entry to be edited, enter the number of the entry being added. Be sure to make the additional entries in the order in which they are to be numbered.

```
ENTER THE NUMBER OF ANY INCORRECT ENTRY, ENTER 0 IF
ALL ARE CORRECT:
11

APPROVE CURRENT ENTRIES AND MORE WILL BE ADDED.
ENTER THE NUMBER OF ANY INCORRECT ENTRY, ENTER 0 IF
ALL ARE CORRECT:
0

ENTER THE NUMBER OF ANY INCORRECT ENTRY, ENTER 0 IF ALL
ARE CORRECT:
11

AIRCRAFT TYPE:
```

If the additional entries fill the current group and the user attempts to add more, this message appears

```
APPROVE CURRENT ENTRIES AND MORE WILL BE ADDED:
```

When all of the traffic mix data entries in the current group are correct, enter a "0". The program will then create another group and the user may continue adding traffic mix data.

When all additions have been made and checked, enter a "0" and the program will go on to editing optional takeoff modification.

7.9 EDITING TAKEOFF MODIFICATIONS

The user may review, change, add, or delete takeoff modification data. Previously entered modifications are reviewed in groups of five. When the Input Module, Edit Mode, gets to Takeoff Modification data it will query

DO YOU WANT TO REVIEW OR EDIT TAKEOFF MODIFICATIONS?

If there is no takeoff modification data in the old airport data file the program will proceed as explained in Section 4.2.9.

If the user's answer to the above query does not start with a "Y" (i.e., NO), the previously entered takeoff modification data will be copied, unchanged, to the new airport data file and the editing will end. Otherwise the program will ask

DO YOU WISH TO REPLACE ALL THE MODIFICATIONS?

If the answer starts with a "Y" the program will proceed as explained in Section 4.2.9.

Otherwise, the user will be asked to review and change or approve the modification overrides (See Section 4.2.9). When the overrides have been edited, the user will be presented with the takeoff modifications in groups of five.

DO YOU WISH TO REVIEW OR EDIT MODIFICATIONS 1 TO 5?

If the answer starts with an "N", the group of modifications will be copied, unchanged, to the new airport data file. Otherwise the program will ask

REVIEW?

If the answer starts with a "Y" the group of takeoff modifications will be displayed on the user's terminal.

#	REST	TYP	GRADIENT	START	END	TRACKS AFFECTED									
1		1		3000.	10.	3	0	0	0	0	0	0	0	0	0
2		5	0.04	3.	8000.	7	8	0	0	0	0	0	0	0	0

The program will then ask

EDIT?

If the user's answer does not start with a "Y" (i.e., NO), the group of modifications will be copied, unchanged, to the new airport data file. Otherwise, the program will query

ENTER THE NUMBER OF ANY MODIFICATION IN THE GROUP YOU WISH TO DELETE.

ENTER 0 WHEN DONE:

If the user enters the number of any modification in the current group, that modification will not be copied to the new airport data file. When any desired deletions have been made, enter a zero and the program will let the user change or add modifications as explained in Section 4.2.9.

8.0 ESTIMATING PROGRAM COSTS

The INM program can provide a nearly complete picture of the noise environment around civil airports at reasonable costs. Charges for computer time depend on the number of computations necessary for any specific scenario. Therefore, the larger the number of operations, runways, and flight tracks, the greater the run cost. Also, the selection of options affects the costs. Costs also will vary depending on the computer time charges of the chosen processing location. A commercial timesharing company has processed the five airport cases supplied with the model for the following costs:

Case 1.	CONTOUR ANALYSIS - 2 NEF CONTOURS	\$28.50
Case 2.	CONTOUR ANALYSIS - 2 Ldn CONTOURS	\$30.90
Case 3.	GRID ANALYSIS - 10 GRID POINTS	\$ 3.30
Case 4.	GRID ANALYSIS - 10 GRID POINTS	\$ 4.80
Case 5.	GRID ANALYSIS - SINGLE GRID POINT WITH DETAILED OUTPUT OPTIONS	\$ 3.60

8.1 EFFECTS OF MODEL SIZE

The Figures 8.1-1 through 8.1-3 show the cost relationship as a function of model input parameters. The run costs relationships were generated under a standard prime-time default computer time priority. The Figures describe the effects of an increase

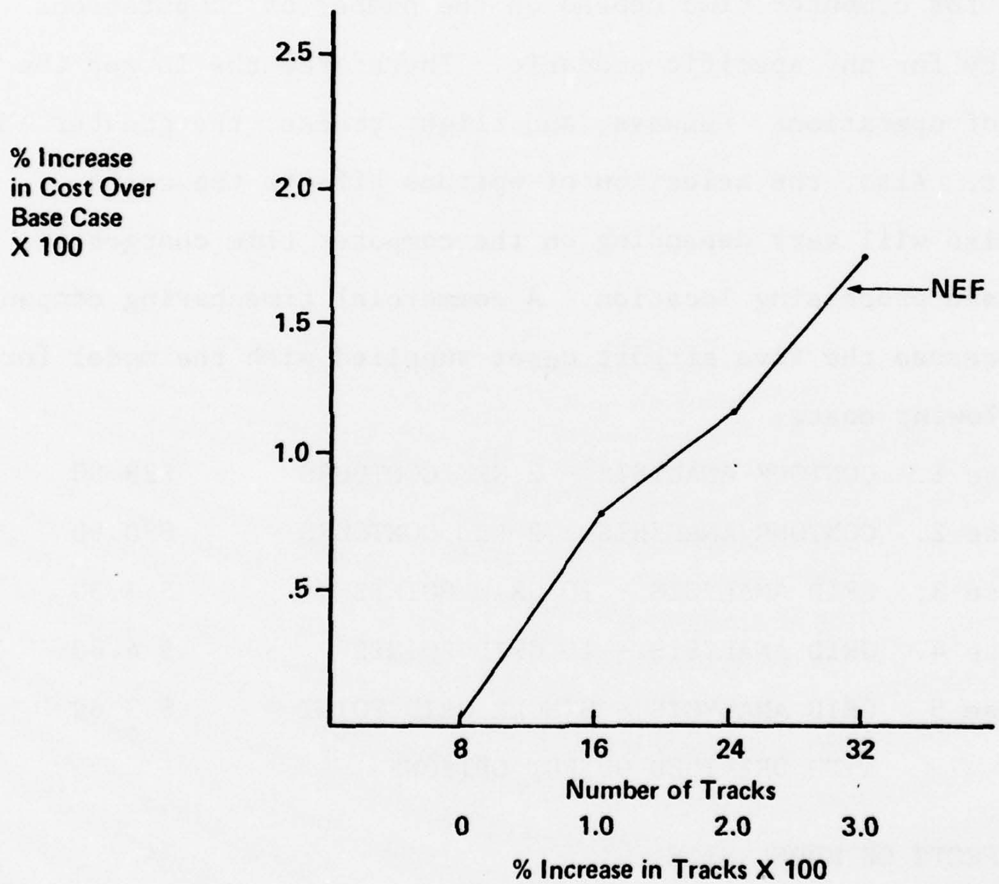


FIGURE 8.1-1. COST AS A FUNCTION OF THE NUMBER OF TRACKS (BASE COST: NEF $28)

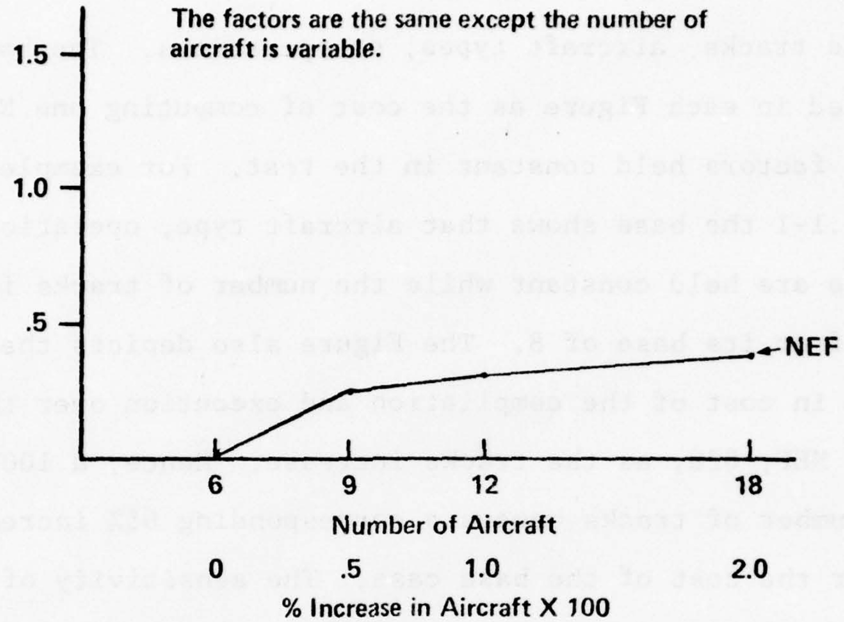


FIGURE 8.1-2. COST AS A FUNCTION OF THE NUMBER OF AIRCRAFT (BASE COST: NEF $28)

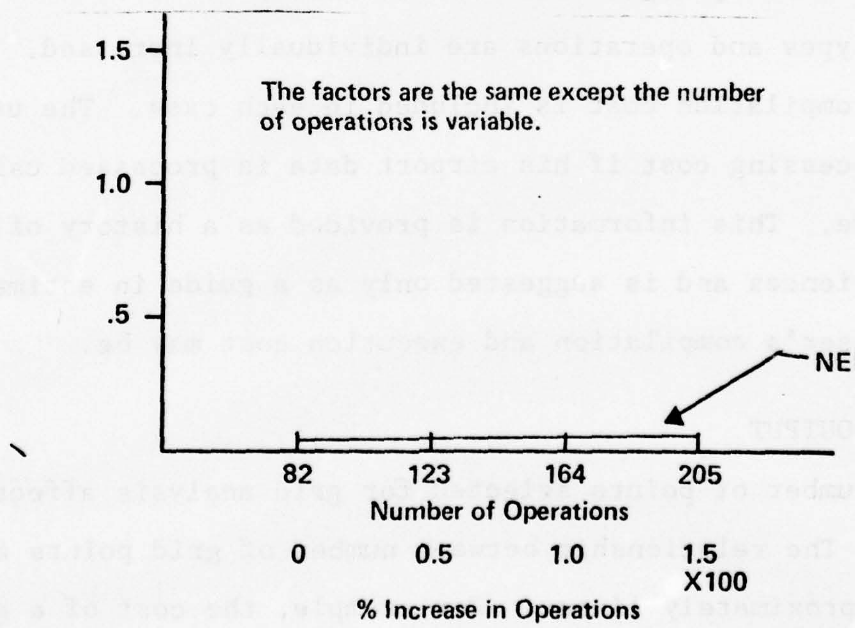


FIGURE 8.1-3. COST AS A FUNCTION OF THE NUMBER OF OPERATIONS (BASE COST: NEF $28)

in ground tracks, aircraft types, or operations. The base case is defined in each Figure as the cost of computing one NEF along with the factors held constant in the test. For example, in Figure 8.1-1 the base shows that aircraft type, operations, and tolerance are held constant while the number of tracks is increased from its base of 8. The Figure also depicts the total increase in cost of the compilation and execution over the base cost for NEF, $28, as the tracks increase. Hence, a 100% increase in the number of tracks causes a corresponding 65% increase in cost over the cost of the base case. The sensitivity of Leq, Ldn, and CNEL are very similar to the behavior of the NEF.

The remaining Figures (8.1-2 and 8.1-3) describe cost as aircraft types and operations are individually increased. Note that the compilation cost is included in each case. The user may reduce processing cost if his airport data is processed using object code. This information is provided as a history of FAA's cost experiences and is suggested only as a guide in estimating what the user's compilation and execution cost may be.

8.2 GRID OUTPUT

The number of points selected for grid analysis affects the run cost. The relationship between number of grid points and run cost is approximately linear. For example, the cost of a grid analysis run with twice as many points as another run should be

expected to cost twice as much.

The cost of a grid analysis run also will depend upon the options selected. The request for detailed information for each flight at each grid point will increase the run cost by 40%. The request for the contributions to the total noise value of the aircraft assigned to each noise curve set at each point will increase the run cost by approximately 35%. The request for both grid options will increase the run cost by 50%.

8.3 CONTOUR OUTPUT

There are three primary parameters of the contour analysis model that affect run cost. These parameters are:

1) number of contours

2) maximum stepsize

3) contour tolerance

Figures 8.3-1 through 8.3-3 show the cost relationship as a function of contour run parameters.

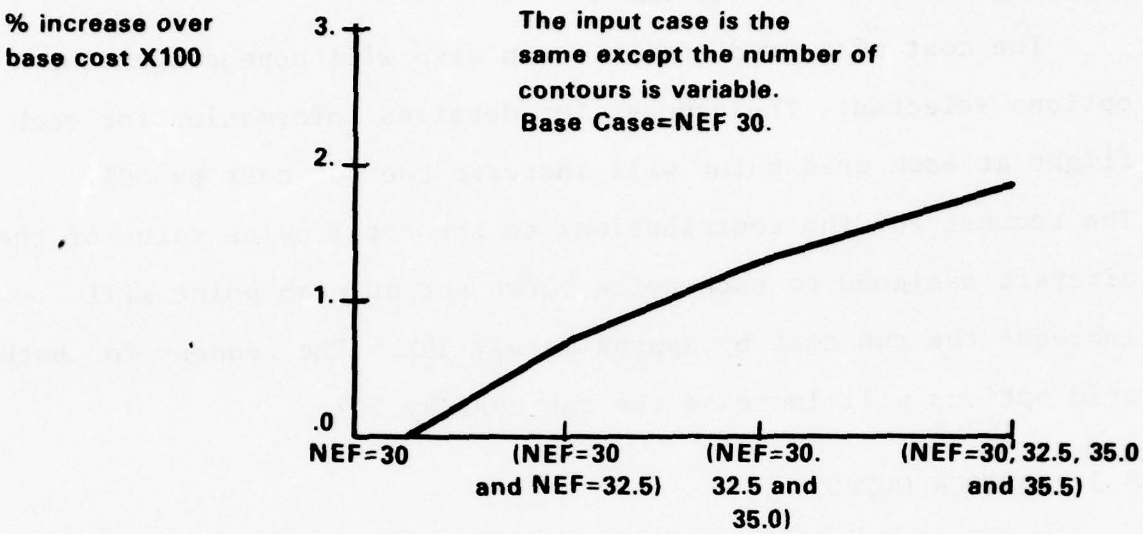


FIGURE 8.3-1. COST AS A FUNCTION OF TWO NUMBER OF AIRCRAFT (BASE COST: NEF $28)

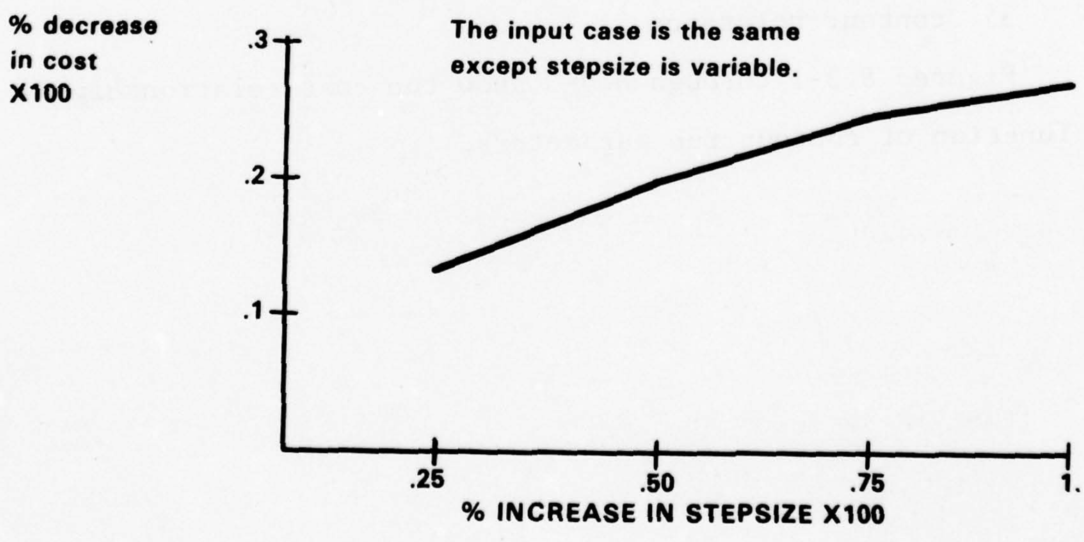


FIGURE 8.3-2. COST AS A FUNCTION OF CONTOUR STEPSIZE (BASE COST: NEF $28)

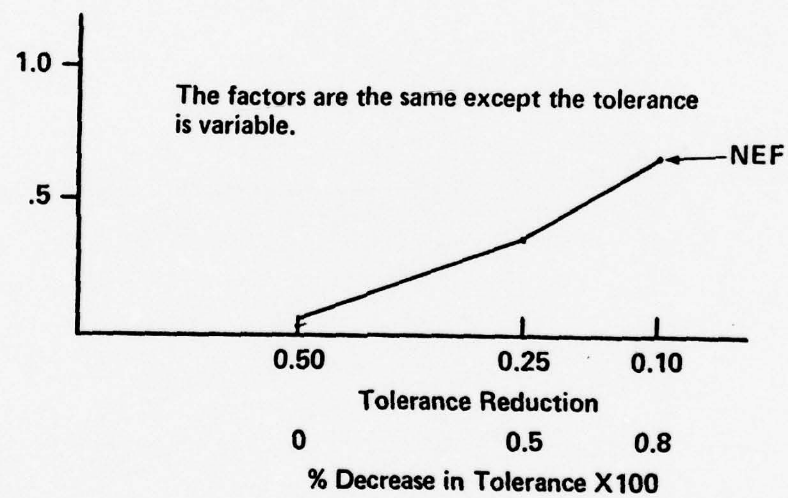


FIGURE 8.3-3. COST AS A FUNCTION OF THE COMPUTATIONAL TOLERANCE (BASE COST: NEF $28)

9.0 PUNCHED CARDS

The bulk of this document describes the use of the Input Module which enables the user to create an input file by answering queries prompted at an interactive computer terminal. The key to the use of the Input Module is ready access to an interactive computer terminal. This may not always be possible. For those situations and for very large input files which would require a session of several hours on an interactive terminal, the instructions for the preparation of keypunched computer cards are presented in this section.

9.1 INTRODUCTION

Unlike the Input Module, the user of computer cards requires some knowledge of constructing the information necessary to execute computer programs in the proper form. The following terms are used throughout this section:

1. Alphanumeric - a character or group of characters which includes the alphabetic characters and numeric characters. On the card forms used in this section, alphanumerics are denoted by "A."
2. Batch - a method of processing a program execution such that the job is sent to the computer center via telephone lines or over the counter and the computer executes the job in time.

3. Card - a punchcard with a series of holes for use in coding instructions. Throughout this section, card also refers to card image which is representation in storage of the information coded on the card.

4. Column - a character position on a card or card image.

5. Data base - set of information that is internally accessible to the computer and on which the computer performs.

6. Field - a group of one or more neighboring columns.

7. File - a collection of cards treated as a unit.

8. Integer - whole number. On the card forms, integers are denoted by "I."

9. Job - a complete set of instructions which guide the computer in executing a task or set of tasks.

10. Keypunch - referring to a devide which punches holes in cards.

11. Keyword - a group of alphanumerics which signal a program to a specific action.

12. Left-justified - referring to a set of characters or digits which are entered beginning in the leftmost column of a field.

13. Line - same as card image. (See definition of card.)

14. Logical unit number - a convention of the computer language FORTRAN in which a temporary input or output file is given an identifier for read or write purposes in the program.

15. Real number - not a whole number in which the number includes a decimal point (or implied decimal point). On the card forms, real numbers are denoted by "R."

16. Right-justified referring to a set of characterers or digits which are entered in a field such that the last character is in the rightmost column of the field.

The INM and all accompanying programs (except Input Module) operate in a batch environment. Thus, the airport information must be accessible to the INM through an internal file or through reading a set of cards. The standard data on aircraft noise and performance is internally accessible. An INM execution results in the creation of output file(s). Computer support personnel can instruct the user on the specific process. This guide presents the instructions to produce the input file and decipher the output files. In this section, the Input Module has been bypassed and the instructions deal with the creation of the input file in proper card format.

9.2 INPUT

To facilitate the user's grasp of the construction of the input file, card forms which define the proper column entry and character type and examples of card images are presented after each set of instructions. The INM handles the airport and operations data in a series of sections such as Airport Section, Aircraft Selection Section, Profile Section, etc. To trigger the model to read the data in proper format, the user must begin each input section with an input control card which contains a keyword beginning in the first column.

The input keywords are composed entirely of digits and are defined as follows:

Keyword	INM Action
100---1	Read Airport Section
107	Read Aircraft Selection Section
101	Read Profile Section
108	Read Alternative Approach Parameters Section
102	Read Alternative Noise vs. Distance Section
100---3	Read Aircraft Mix Section
103	Read Takeoff Profile Modification Section

(Skipping a column is denoted by "-")

The input keywords are entered beginning in the first column of the input control cards. Any comments or information may appear beginning in the thirteenth column of the control card and will be echoed on the output.

The examples of card images at the end of each set of instructions also give the input control card that begins that section. To further separate the input sections, a blank card (or line) must be used. The blank card signals to the model that the previous input section has ended and to expect the input control card of another section to follow the blank card. Thus, an input file is a series of blocks of information on an airport and its operations which are logically tied together. Keywords are also required in specifying the desired form of output but are somewhat different than the input keywords. Output keywords are discussed in the section on output.

The first line to appear on any input file is the title which identifies the case. The title may consist of a variety of alphanumerics up to 80 characters in total. The INM will center the title on every page of the output.

9.2.1 AIRPORT SECTION

The first section which must appear in the scenario data is the physical description of the runways and their respective tracks. In the INM, a track is the projection of an aircraft's flight path on the ground. The terrain is assumed to be flat and grass-covered. There are three types of cards in this section:

1. The altitude and temperature card.
2. The runway definition card.
3. The track definition card.

<u>Altitude and Temperature Card</u>

The altitude and temperature card contains the airport altitude above sea level in feet and the average airport temperature in degrees celsius. The airport temperature is the average daily temperature of the period under consideration. If the scenario reflects a typical hot day, then the average summer temperature is entered. Most scenarios will require the average annual temperature.

<u>The Runway Definition Card</u>

The runway definition cards establish the airport geometry and its relationship to the surrounding area. Before filling out these cards, the user must define a cartesian coordinate system with which to describe the airport. The unit of distance is the foot and the positive X- and Y- axes must run east and north, respectively, as on

a typical map. The placement of the origin, point (0,0). is arbitrary except that computational precision requires that the distances from the origin to the runways should be small. The user enters the X-, Y- coordinates of each runway end on these cards, giving the INM the information it needs to reconstruct the user's coordinate system. Two cards must be used to model a runway. A single card handles all departures in one runway direction and all arrivals in the opposite direction or, equivalently, all departures or arrivals which fly over the same runway end. Two pairs of X-, Y- coordinates, each corresponding to a runway end, are entered on a runway definition card. Each coordinate pair, or runway end, has two definitions, one corresponding to departures and one to arrivals. The first pair locates the end of the runway where a departing aircraft begins its takeoff roll and the far end of the runway as viewed from an approaching aircraft. The second pair locates the end of the runway which connects with the track and is defined as the takeoff flyover end and the approach end. Figure 9.2.1.1 displays the relationship of the pairs of coordinates to the type of aircraft operation. The user further identifies what he means on each card by using the runway name fields to specify the takeoff runway direction number and the approach runway direction number, respectively, as they

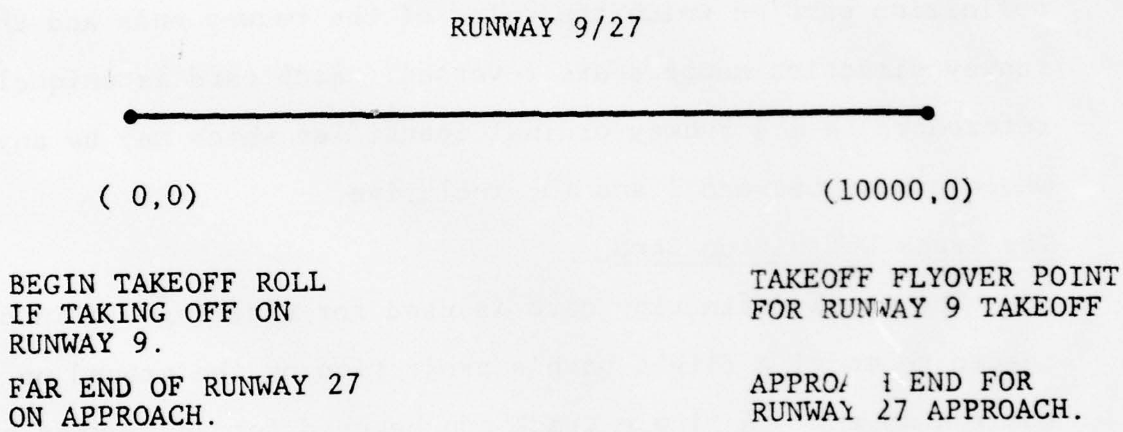


FIGURE 9.2.1-1 THE RUNWAY END POINTS

would appear on the runway ends. The runway direction number is a whole number to the nearest one-tenth of the magnetic bearing of the runway and is measured in degrees clockwise from magnetic north. In the case of a pair of parallel runways, the runway direction number should be appended with the characters "L" for left and "R" for right to distinguish one runway from the other. As mentioned above, to model a complete runway, a runway definition card must be accompanied by another runway definition card on which the roles of the runway ends and the runway direction numbers are reversed. Each card is uniquely referenced by its runway ordinal identifier which may be any whole number between 1 and 15, inclusive.

The Track Definition Card

The track definition card is used for entering all information needed to model a flight path's projection on the ground up to the runway end. A single track can be used for any number of operations, both arrivals and departures (see AIRCRAFT MIX SECTION). A track is referenced by specifying a track identifier between 1 and 88, inclusive, and selecting the runway ordinal identifier which represents the end of the runway which connects with this track. In this scheme, one needs not model separate tracks for arrivals and departures which follow the same flight path projection. A track is made up of segments which are either curved or straight. The first segment connects with the runway end and must be straight. Thus, only a length in nautical miles

is necessary to describe it. The user models subsequent segments with pairs of entries. If the segment is straight, the first entry is the length of the segment in nautical miles and the second entry is blank or zero. If the segment is curved, the first entry is the turn angle in degrees and the second entry is the turn radius in nautical miles. The turn angle represents the absolute value of the difference between the final heading of the previous segment and the initial heading of the next segment. This is equivalent to the angle of arc of the turn. Positive radii represent clockwise turns and negative radii represent counter-clockwise turns as viewed from above. A single turn cannot exceed 270 degrees and no more than two curved segments may be modeled in succession. The second segment must be curved and no track definition can end with a curved segment. If more than eight segments are to be modeled, the same scheme is extended using a track definition continuation card. A track can be defined by up to 15 segments.

9.2.2 AIRCRAFT SELECTION SECTION

In this section, the user selects all aircraft to be included in a scenario. An aircraft in the INM is defined by a combination of four sets of data: a set of noise vs. distance tables (noise curves) for EPNL and NEL, a set of approach parameters describing performance during arrival, a set of takeoff profiles, and a set of directivity parameters for calculating time above an A-weighted decibel level (TA). The INM data base contains an entire combination of the above sets for each

AIRPORT

Columns	Description	Type
Altitude and Temperature Card		
1-10	airport altitude in feet above sea level	R
11-20	airport temperature in ^{o}C	R
Runway Definition Card(s)		
2-3	runway ordinal identifier (not direction number)	1 ≤ I ≤ 15
5-12 14-21	X and Y coordinates of the takeoff flyover end (far end on approach)	R
32-39 41-48	X and Y coordinates of the takeoff flyover end (approach end)	R
58-60	takeoff runway direction number	A
61-63	approach runway direction number (opposite of above)	A
64-80	comments	A

A blank card must separate the last runway card from the first track card.

Columns	Description		Type
Track Definition Card(s)			
1-2	runway ordinal identifier		1 ≤ I ≤ 15
3-4	track identification number		1 < I < 88
5-6	number of track segments		1 < I < 15
7-11	length of first segment in n.mi.		R
12-16 17-21	seg 2	ordered pair of numbers describing each segment: straight segment: 1. length in n.mi. 2. zero or (blank) curved segment: 1. turn angle (angle of arc) in degrees 2. radius of turn in n.mi. (+) clockwise (-) counterclockwise	R
22-26 27-31	seg 3		
32-36 37-41	seg 4		
42-46 47-51	seg 5		
52-56 57-61	seg 6		
62-66 67-71	seg 7		
72-76	length (straight) or angle (curved) of segment 8		R
77-80	Comments		A

Airport (Cont'd)

Columns	Description	Type
	Track Definition Continuation Card	
1-6	LEAVE BLANK	
7-11	radius of segment 8 if curved (otherwise (blank) or zero)	R
12-71	ordered pairs describing segment 9-14 (same as for segments 2-7)	R
72-76	length of segment 15 in n.mi.	R

Type:

I - right justified integer
R - right justified integer or real number with a decimal point
A - alphanumeric

```
100   1          AIRPORT SECTION
       0.0      15.0
   1  10000.       0.                 0.       0.         27  9 T.O. RWY 27
   2      0.       0.             10000.       0.          9 27 T.O. RWY 9
   3   7000.   -7000.              2000.    2000.         31 13 T.O. RWY 31
   4   2000.    2000.              7000.   -7000.         13 31 T.O. RWY 13

1 1 1  50.
1 2 3    .5  45.   1.5  50.
3 3 1  50.
2 4 5    .5  90.  -1.5  1.5   0.  45.  -1.5  50.
2 5 1  50.
2 6 3    .5  10.   1.5  50.
4 7 3    .5  30.  -1.5  50.
4 8 3   1.0  30.  -1.5  50.
```

aircraft type. One may use the aircraft as defined in the data base or model aircraft with certain combinations of data sets created by the user and data sets retrieved from the data base.

Each noise curve, approach parameter set, takeoff profile, and directivity parameter set has an identification number. The INM uses these numbers to associate each data set with an aircraft type. The aircraft types, their respective identification numbers, and their associated data set identification numbers are listed in Figure 9.2.2.1 as stored in the data base. One of two types of cards may be used for selecting aircraft depending on how these component parts are to be arranged.

The Aircraft Retrieval Card

If the user wishes to model aircraft with the same component identification numbers used in the data base he may do so by entering the identification numbers of these aircraft on the aircraft retrieval card. Use of this card would not only cover cases where an aircraft uses the component data sets intended for it in the data base. It is also included when the user plans to enter his own approach parameters or takeoff profiles in the input data under the same identification numbers used in the data base but as replacements for the data base entries. (See the PROFILE and APPROACH PARAMETER SECTIONS.)

The aircraft identification numbers are entered from left to right in two-character fields with commas in between. If more than 25 aircraft are to be modeled this way, a continuation card is necessary. An entry of "1" in column 76 of the initial

AC	NAME	NC	AP	TAKEOFF PROFILES BY TRIP LENGTH CATEGORY 1	2	3	4	5	6	7
1	2E NBTF DC-9-32	2	2	48	49	49	49	0	0	0
2	DC-9-15	2	2	46	47	47	47	0	0	0
3	BAC-111	2	2	48	49	49	49	0	0	0
4	737-100/200	5	5	43	44	45	45	0	0	0
5	3E NBTF 727-200	8	8	18	20	20	20	0	0	0
6	727-100	8	8	17	18	19	20	0	0	0
7	4E NBTF 707-320B/C	11	11	27	28	29	31	34	36	36
8	707-120B	11	11	38	39	40	41	42	42	42
9	720B	11	11	37	38	39	40	42	42	42
10	DC-8-55	11	11	27	28	29	31	34	36	36
11	DC-8-61/63	11	11	30	32	33	35	36	36	36
12	CONVAIR-990	11	11	28	30	31	32	34	34	34
13	4E NTJ 707-120/320	19	19	21	22	23	24	25	26	26
14	720	18	18	21	22	23	24	25	25	25
15	DC-8-30	20	20	21	22	23	24	25	26	26
16	CONVAIR-880	19	19	22	23	24	25	25	25	25
17	VC-10	19	19	27	28	29	30	31	32	32
18	STOL F-28-2000	1	1	61	62	62	0	0	0	0
19	SST CONCORDE	17	17	76	76	77	77	78	78	78
20	2EWB A300 AIRBUS	13	13	50	51	51	52	53	0	0
21	3E MR WB DC-10-10	14	14	12	13	14	15	16	16	16
22	3 ENG WB L-1011	15	15	12	13	14	15	16	16	16
23	3E LR WB DC-10-30	14	14	56	56	57	58	59	60	60
24	3E LR WB STRETCH	14	14	56	57	58	59	84	85	85
25	4 ENG WB 747-200	16	16	6	7	8	9	10	11	11
26	747-100	16	16	1	2	3	4	5	5	5
27	747 STRETCH	16	16	79	79	80	81	82	83	83
28	DC9 W/SAM ENGINES	3	3	48	49	49	49	0	0	0
29	737 W/SAM ENGINES	6	6	43	44	45	45	0	0	0
30	727 W/SAM ENGINES	9	9	17	18	19	20	0	0	0
31	707 W/SAM ENGINES	12	12	27	28	29	31	34	36	36
32	DC8 W/SAM ENGINES	12	12	30	32	33	35	36	36	36
33	727ADV W/SAM ENG.	9	9	63	63	64	65	0	0	0
34	2ETPQ F-27 FOKKER	4	4	54	54	54	0	0	0	0
35	LTJ GA	7	7	55	0	0	0	0	0	0
36	MTJ GA	10	10	66	66	66	0	0	0	0
37	HTJ GA	40	40	67	67	67	0	0	0	0
38	MTF GA	21	21	86	86	86	0	0	0	0
39	MTETP GA	22	22	87	87	0	0	0	0	0
40	LTEP6 GA	23	23	88	0	0	0	0	0	0
41	LSEP2 GA	24	24	89	0	0	0	0	0	0
42	LSEP4 GA	25	25	90	0	0	0	0	0	0
43	MSEP6 GA	26	26	91	0	0	0	0	0	0
44	MTEP10Q GA	27	27	92	0	0	0	0	0	0
45	MTEP10L GA	28	28	93	0	0	0	0	0	0
46	LQTF GA	29	29	94	94	94	0	0	0	0
47	HTF GA	30	30	95	95	95	95	0	0	0
48	F-101B,C,F MIL	31	31	96	96	96	96	96	0	0
49	F-104 MIL	32	32	97	97	0	0	0	0	0
50	F-5A,B MIL	33	33	98	98	0	0	0	0	0
51	F-5E MIL	34	34	99	99	0	0	0	0	0
52	T-33A MIL	35	35	100	100	100	0	0	0	0
53	C-5A MIL	36	36	101	101	101	101	101	101	101
54	C-141A MIL	37	37	102	102	102	102	102	102	0
55	C-130E MIL	38	38	103	103	103	103	103	0	0
56	C-130H,N,P MIL	39	39	104	104	104	104	104	0	0
57	C-131 MIL	41	41	68	68	68	0	0	0	0

FIGURE 9.2.2-1 INM DATA BASE #6 IDENTIFICATION NUMBERS

NOTES

Trip length categories:

1 = 0-500	nautical	miles
2 = 500-1000	"	"
3 = 1000-1500	"	"
4 = 1500-2500	"	"
5 = 2500-3500	"	"
6 = 3500-4500	"	"
7 = over 4500	"	"

AC = Aircraft identification number

NC = Noise Curve identification number

AP = Approach Parameter set identification number

FIGURE 9.2.2-1 INM DATA BASE #6 IDENTIFICATION NUMBERS(CONT)

aircraft retrieval card signals to the model that the next card is a retrieval continuation card. This continuation card is filled in the same manner as the retrieval card. No more than 30 aircraft identification numbers can be specified on these cards. If the user does not wish to retrieve any aircraft definitions, the retrieval card is left blank and is followed with a set of aircraft definition cards. If all aircraft are selected using this card, aircraft selection is terminated by following the retrieval card with a blank card and continuing on to the Profile Section.

The aircraft definition card is used when no arrangement of data set identification numbers in the data base suits the user's needs. This situation would arise when modeling aircraft which are not included in the data base or when a data base aircraft is to use an arrangement of data sets with identification numbers different from that given for the aircraft in the data base.

On each card, the user enters the aircraft identification number, the noise curve identification number, the approach parameter identification number, and the takeoff profile identification numbers which the INM will use to construct the aircraft type.

The aircraft identification number should exist in the data base if an aircraft definition is a replacement of one in the data base. For new aircraft types, the number should be between

101 and 150, inclusive. An aircraft identification number may be used only once in the Aircraft Selection Section. The aircraft definition cards must appear in increasing order of aircraft identification number. The last aircraft definition card must be followed by a blank card. The user has the choice of any compatible noise curves in the data base, as numbered as in the data base, or any that he may create himself, numbered between 101 and 150. (See the NOISE VS. DISTANCE TABLES SECTION.) If a card represents the redefinition of a data base aircraft but the user wishes to leave the noise curve as it was, the noise curve field is left blank. Compatible takeoff profiles and approach parameter sets may be selected from the data base or from any the user creates in his input data. (See APPROACH PARAMETER and PROFILE SECTIONS.) Approach parameter sets created by the user which are not to be used as replacements of data base sets are identified with any numbers between 101 and 150. Once again, if the aircraft being modeled is included in the data base and will use some of the same data sets, it would have used if retrieved from the data base, the fields corresponding to these data sets may be left blank.

New, user-created takeoff profiles are numbered between 201 and 250, inclusive. Profile identification numbers are entered in from one to seven of the seven fields provided according to the trip length of the flight, a surrogate for the effect of fuel weight on takeoff performance. These trip lengths are, from left to right: 0-500 n. m., 500-1000 n.m., 1000-1500 n.m., 1500-2500 n.m., 2500-3500 n.m., 3500-4500 n.m., and over 4500 n.m.

Note that control over directivity parameter sets for TA is not provided on the above cards. Directivity parameter sets are retrieved from the data base only for aircraft which use a set of noise vs distance tables from the data base. Thus, if the user provides his own noise vs distance tables for any aircraft, the INM will not calculate values of time above. The Output Section discusses such a case.

A clear understanding of the contents and arrangement of the data base is essential for the proper use of the aircraft definition card. The Data Base Report is provided for that use.

When filling out the Aircraft Selection Section, the user must keep in mind that no more than 99 takeoff profiles, 24 approach parameter data sets, and 24 noise curve tables, either input by the user or retrieved from the data base, may be included in a scenario.

9.2.3 PROFILE SECTION

In the INM an aircraft's profile is a table of altitude, velocity, and thrust represented as functions of ground distance from a runway end. The program interpolates on these tables to find an aircraft's performance characteristics at any point in its flight path. Profiles fall into one of two categories, takeoff profiles and approach profiles. Each is handled somewhat differently by the model and will be discussed separately here.

AIRCRAFT SELECTION

Columns	Description		Type
Aircraft Retrieval Card (s)			
1-75	aircraft identification numbers each using two columns and separated by commas		data base
76	continuation indicator (used for more than 25 to 30)		1
Aircraft Definition Card (s)			
1-3	aircraft identification number		data base $101 \leq I \leq 150$
4-23	aircraft name		A
24-26	noise vs. distance tables identification number		data base $101 \leq I \leq 150$
27-29	approach parameter identification number		data base $101 \leq I \leq 150$
30-32	0-500 n.mi.	Takeoff profile indentification numbers for up to 7 trip lengths	data base $201 \leq I \leq 250$
33-35	500-1000 n.mi.		
36-38	1000-1500 n.mi.		
39-41	1500-2500 n.mi.		
42-44	2500-3500 n.mi.		
45-47	3500-4500 n.mi.		
48-50	4500 + n.mi.		

Type:
- I - right justified integer
- R - right justified integer or real number with a decimal point
- A - alphanumeric

```
107                       AIRCRAFT SELECTION SECTION
 3, 5, 8,43
 17 AIRCRAFT X          19101 27 28 29 30 31 32 32
101 AIRCRAFT Y        101102201201202202 0   0   0
102 AIRCRAFT Z          20 18 38 28 39 29
```

Takeoff Profiles

Inclusion of takeoff profiles in the input data is optional. The user should only include them if the profiles stored in the data base do not suit his needs. If he wishes to replace a stored takeoff profile and preserve the numbering scheme by which the profile is referenced in the data base, the user only needs to enter the new profile under the identification number of the data base profile it replaces. Under these circumstances he does not enter an aircraft definition card in the Aircraft Selection Section. (See AIRCRAFT SELECTION SECTION.) Alternatively, the user may wish to include a profile which has no counterpart in the data base. This may occur either in the case of a new, user-created aircraft or a redefined data base aircraft. Notice that in the data base, several aircraft use the same profiles. Replacement of such profiles as described above will affect all aircraft using them. One may avoid this side effect by including new aircraft specific profiles. The user must identify any new profiles with a number between 201 and 250, inclusive, both in this section and in the Aircraft Selection Section. A set of five cards represents a profile. They are in the order in which they appear: (1) a profile identification card, (2) a ground distance card, (3) an altitude card, (4) a velocity card, and (5) a thrust card.

Profile Identification Card

The profile identification card merely contains the identifier, an indicator designating whether ground distances are to be interpreted as in feet or in nautical miles, and a

textual description of the profile. The indicator field should be left blank if the distances are to be read in nautical miles and filled with the integer '1' if they are to be read in feet.

Ground Distance Card

Seven entries must appear on the ground distance card. Each ground distance represents the point when a new profile segment is to begin. Ground distances are measured from the start of takeoff roll end of the runway and are filled from left to right as the aircraft takes off. The leftmost entry represents the start of takeoff roll end and must be zero. The next entry represents the point of liftoff. The number entered here is the length of the takeoff roll. Subsequent points represent ends of segments as the aircraft leaves the airport. These distances must be increasing.

Altitude Card

The third card contains altitudes above the runway in feet at each of the ground distances. They must be non-descreasing and the first two entries must be zero.

Velocity Card

The fourth card contains velocities in knots at each ground distance. The leftmost should be 32 knots, which represents taxiing speed. In addition to seven entries of velocities, the number of engines for aircraft using this profile must be entered using the eighth field.

Thrust Card

The fifth card should contain values of power for the segments between each of the ground distances in units of pounds per engine or any acceptable unit associated with aircraft performance. The first field contains the value for the ground roll segment, the second, the first takeoff segment and so on. Thus, the seventh field should remain blank. The aircraft's takeoff weight in pounds should appear in the eighth field.

The INM may include up to 99 takeoff profiles, including those from the data base. As many profiles as desired may be entered here as long as this limit is not exceeded.

Approach Profiles

All approach procedures used at the airport must appear in the input data. Each approach profile is modeled with a set of five cards. A set of approach profile cards provides the INM with a set of ground distances from the approach end of the runway, reference values of altitude and velocity at each of these and an indication of the power settings between them. The ground distances divide the approach profile into a set of discrete connected segments of which there must be at leave five. The data must appear such that one may follow the approach characteristics of an aircraft in time by reading the cards from right to left. In other words, the leftmost values describe the aircraft as it finishes its landing and the rightmost describe early segments in its appraoch. The user enters certain values of velocity, landing roll distance, and approach thrust indirectly by using

indicators. These indicators refer the INM to the appropriate data locations in the data base or to those provided by the user. (See APPROACH PARAMETER SECTION.) This scheme enables the user to model approaches for many aircraft types with only one approach profile. An identification number unique to each profile and between 301 and 350, inclusive, must appear on the profile identification card. The user may leave the ground distance indicator field blank or insert a '1' to indicate whether he wishes to enter ground distances in nautical miles or feet, respectively. The rest of the card may contain a textual description of the profile.

Ground Distance Card

The ground distance card should contain the set of distances mentioned above. All distances are measured using the approach end of the runway as the zero point. Positive distances represent points off the runway and negative distances points on the runway. The leftmost distance, representing the end of landing roll, is specified indirectly by entering the indicator '-1.' This tells the INM to retrieve a landing roll distance for each aircraft using this profile and to use it to calculate the distance from the stop point to touchdown. The next entry represents the point of touchdown. This point is on the runway so the distance should not be positive. Distances beyond the runway end must be positive and should be strictly increasing as read from left to right on the card. At least six values must appear on this card to describe the minimum five segments mentioned above.

Altitude Card

The altitude card should contain the altitudes of the aircraft in feet above the runway at each of the above ground distances. The two leftmost entries must, of course, be zero to model landing roll. The altitudes must be non-increasing as the aircraft approaches the runway (reading the card from right to left).

Velocity Card

The velocity card may be filled either with velocities in knots or "-2." indicators, specifying that a typical landing speed for each aircraft be retrieved from the data base. Once again, velocities must be non-increasing as the aircraft approaches the runway.

Thrust Card

Thrust setting indicators for the various segments defined between the above points are entered on the fifth card. These indicators and their meanings are listed in Table 9.2.3.1. Indicator "-10.", used for reversal thrust, may not be used for general aviation or military aircraft. The user should fill one fewer field on the thrust card than he fills on the previous card, since these values represent values of thrust for the segments between points on the profile. A blank card after the end of a set of profile cards indicates to the INM that all profiles have been read and that the next card is a control card initiating the next input data section.

Indicator	Description
-3	Thrust for 3 degree glide slope with landing flaps (lbs/eng)
-4	Thrust for 6 degree glide slope with landing flaps (lbs/eng)
-5	Thrust for level flight with approach flaps (lbs/eng)
-6	Thrust for 3 degree glide slope with approach flaps (lbs/eng)
-7	Thrust for level flight with maneuver flaps (lbs/eng)
-8	Thrust for 500 ft/nmi descent with maneuver flaps (lbs/eng)
-9	Idle Thrust (lbs/eng)
-10	Reversal Thrust (lbs/eng)

NOTE: Indicators -4 through -10 do not apply to general aviation propellor aircraft or military aircraft.

TABLE 9.2.3-1 INDICATORS AND THEIR MEANING

TAKEOFF PROFILE (OPTIONAL)

Columns	Description	Type
Profile Identification Card		
1-3	profile identification number	data base $201 \leq I \leq 250$
4-6	ground distance units indicator (blank) = n.mi. 1 = ft.	I
7-80	profile description	A
Ground Distance Card (units specified above)		
1-8	ground distance at start of takeoff roll	$R = 0$
9-16	length of takeoff roll	$0 < R$
17-24	distances from start to the start point of each segment	$0 < R$
25-32		
33-40		
41-48		
49-56		
Altitude Card		
1-8	altitude at start of takeoff roll in feet above runway	$R = 0$
9-16	altitude at takeoff point in feet above runway	$R = 0$
17-24	altitudes at each of the ground distances entered above in feet above runway	$0 < R$
25-32		
33-40		
41-48		
49-56		
Velocity Card		
1-8	taxi speed in ktas	$R = 32$
9-16	liftoff velocity in ktas	$0 < R$
17-24	velocities at the ground distances entered above in ktas	$0 < R$
25-32		
33-40		
41-48		
49-56		
57-64	number of engines	$0 < R$

TAKEOFF PROFILE

Takeoff Profile (Cont'd)

Columns	Description	Type
Thrust Card		
1-8	takeoff thrust in lbs./engine	0 < R
9-16	thrust for each segment in lbs./engine	
17-24		
25-32		0 < R
33-40		
41-48		
57-64	takeoff weight in lbs	0 < R

Type:

I - right justified integer
R - right justified integer or real number with a decimal point
A - alphanumeric

```
101            PROFILE SECTION
 18  1         REPLACEMENT B727-200 T.O. PROFILE
0.      5000.   25000.  50000.  75000.  100000. 150000.
0.      0.      2000.   4500.   7000.   9500.   14500.
32.     160.    160.    160.    160.    160.    160.    3.
15000.  15000.  15000.  15000.  15000.  15000.          120000.
201  1         AIRCRAFT Y SHORT RANGE T.O. PROFILE
0.      5000.   25000.  50000.  75000.  100000. 150000.
0.      0.      2000.   4500.   7000.   9500.   14500.
32.     200.    200.    200.    200.    200.    200.    3.
30000.  30000.  30000.  30000.  30000.  30000.          300000.
202  1         AIRCRAFT Y LONG RANGE T.O. PROFILE
0.      10000.  20000.  50000.  70000.  100000. 150000.
0.      0.      2000.   4000.   6000.   9000.   14000.
32.     250.    250.    250.    250.    250.    250.    3.
30000.  30000.  30000.  30000.  30000.  30000.          350000.
```

APPROACH PROFILE

Columns	Description	Type
Profile Identification Card		
1-3	profile identification number	301 < I < 350
4-6	ground distance unit indicator (blank) = n. mi. 1 = ft.	I
7-80	profile description	A
Ground Distance Card (in units specified above)		
1-8	stop distance indicator	R = -1
9-16	distance from runway approach end to touchdown	R < 0
17-24	distances from runway approach end to end points of the segments	0 < R
25-32		
33-40		
41-48		
49-56		
Altitude Card		
1-8	altitude at stop point in feet above runway	R = 0
9-16	altitude at touchdown in feet above runway	R = 0
17-24	altitudes at the ground distances entered above in feet above runway	0 < R
25-32		
33-40		
41-48		
49-56		
Velocity Card		
1-8	taxi speed	R = 32
9-16	touchdown velocity (may use indicator)	R
17-24	velocities at ground distances entered above in ktas	R = -2 or 0 < R
25-32		
33-40		
41-48		
49-56		

Type:
- I - right justified integer
- R - right justified integer or real number with a decimal point
- A - alphanumeric

APPROACH PROFILE
(continued)

Columns	Description	Type

Thrust Card

Columns	Description	Type
1-8	indicator -10 for reversal or -3 for landing thrust	R = -10, R = -3
9-16 17-24 25-32 33-40 41-48	indicators -3 through -9 for various thrust settings for each segment	R = -3, -4, -5, -6, -7, -8, -9

Type:
- I - right justified integer
- R - right justified integer or real number with a decimal point
- A - alphanumeric

Note:
Indicators -4 through -10 do not apply to piston powered general aviation aircraft or any of the military aircraft.

```
301          STANDARD 3 DEGREE APPROACH
    -1.0   -.165   2.975   9.255   12.395   18.675
     0.0     0.0   1000.   3000.   4000.    5000.
     32.     -2.     -2.     -2.     -2.      -2.
    -10.     -3.     -6.     -6.     -6.
302          STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
    -1.0   -.165   2.975   9.255     12.    15.14
     0.0     0.0   1000.   3000.   3000.    4000.
     32.     -2.     -2.     -2.     -2.      -2.
    -10.     -3.     -6.     -6.     -6.
303          BA. 3 DEGREE APPROACH
    -1.0   -.165   2.975   9.255   12.395   18.675
     0.0     0.0   1000.   3000.   4000.    5000.
     32.     -2.     -2.     -2.     -2.      -2.
     -3.     -3.     -3.     -3.     -3.
```

9.2.4 THE ALTERNATIVE APPROACH PARAMETERS SECTION

When the user specifies an approach profile (See PROFILE SECTION), he uses indicator to tell the INM to find values of various performance characteristics for each aircraft using the profile. This information may be retrieved either from the data base or from entries provided by the user in this section and includes values of the following for each aircraft: landing weight, number of engines, stop distance from touchdown, approach speed, and thrust values for each of the eight thrust setting indicators described in Table 9.2.3.1. Approach parameters are stored for each aircraft in the data base under the same identification number as that under which each aircraft's noise curve is stored. If an aircraft appears on the aircraft retrieval card, the approach parameter data set is retrieved automatically. The user may replace a data base approach parameter set by entering one in this section under the same number which the data base uses. Notice, however, that several aircraft may use the same approach parameters. If this is the case and the user wishes to change only those parameters which pertain to a single aircraft, he must change the aircraft's definition (See AIRCRAFT SELECTION Section) and enter the approach parameters under a new identification number. Any approach parameter data set which does not have a counterpart in the data base must be numbered between 101 and 150, inclusive. This would be necessary in the above case and also in cases where an aircraft not included in the data base is modeled.

Values of thrust may be entered as needed but values of all other parameters in this section are required. Three cards are

entered for each data set. A blank card should follow the last data set in this section. The user can define up to 24 sets of approach parameters.

9.2.5 ALTERNATIVE NOISE VS DISTANCE TABLES SECTION

The INM data base contains sets of EPNL vs distance tables and a like number of NEL vs distance tables. Each set consists of up to six noise curves corresponding to different power settings. A noise curve is represented by a table of eight noise levels at the eight slant range distances of 200,400,600, 1000, 2000, 4000, 6000, and 10,000 feet. The power setting is usually thrust given in units of pounds per engine. However, any power unit may be used as long as it is consistent for all noise curves, takeoff profiles, and approach parameters used by a particular aircraft type. Each noise vs. distance data set is assigned to an aircraft in the data base by the association of an aircraft identification number with a noise curve identification number. (See AIRCRAFT SELECTION Section.) An aircraft's EPNL noise curves and NEL noise curves are grouped together under the same identicicication number. The EPNL vs. distance data set of the Boeing 727-200 is graphically presented in Figure 9.2.5.1. The Data Base Report presents all of the data base noise curves in this form. The noise data set of the 727-200 contains six noise curves for six thrust values ranging from 13050 to 3500 lbs per engine. A noise data set must be defined by noise curves for any where from two to six power settings.

ALTERNATIVE APPROACH PARAMETERS (Optional)

Columns	Description	Type
Approach Parameters Identification Card		
1-3	approach parameters identification number	data base $101 \leq I < 150$
Aircraft Description Card		
1-12	aircraft name	A
13-22	landing weight in lbs.	$0 < R$
23-32	number of engines	$0 < R$
Performance Card		
1-8	stop distance (landing roll) in ft.	$0 < R$
9-16	approach velocity in ktas	$0 < R$
17-24	thrust/engine in lbs. 3^o glide slope with landing flaps	$0 < R$
25-32	thrust/engine in lbs. 6^o glide slope with landing flaps	$0 \leq R$
33-40	thrust/engine in lbs. level flight with approach flaps	$0 \leq R$
41-48	thrust/engine in lbs. 3^o glide slope with approach flaps	$0 \leq R$
49-56	thrust/engine in lbs. level flight with maneuver flaps	$0 \leq R$
57-64	thrust/engine in lbs. 500 ft./n. mi. descent with maneuver flaps	$0 \leq R$
65-72	idle thrust/engine in lbs.	$0 \leq R$
73-80	reversal thrust/engine in lbs.	$0 \leq R$

Type:
- I - right justified integer
- R - right justified integer or real number with a decimal point
- A - alphanumeric

```
108           ALTERNATIVE APPROACH PARAMETERS SECTION
101
ACFT X      100000.   4.
5000.   160.    10000.                  10000.                          15000.
102
ACFT Y      200000.   3.
3000.   180.    15000.  8000.   10000.  12000.  7000.   7500.   4000.   20000.
```

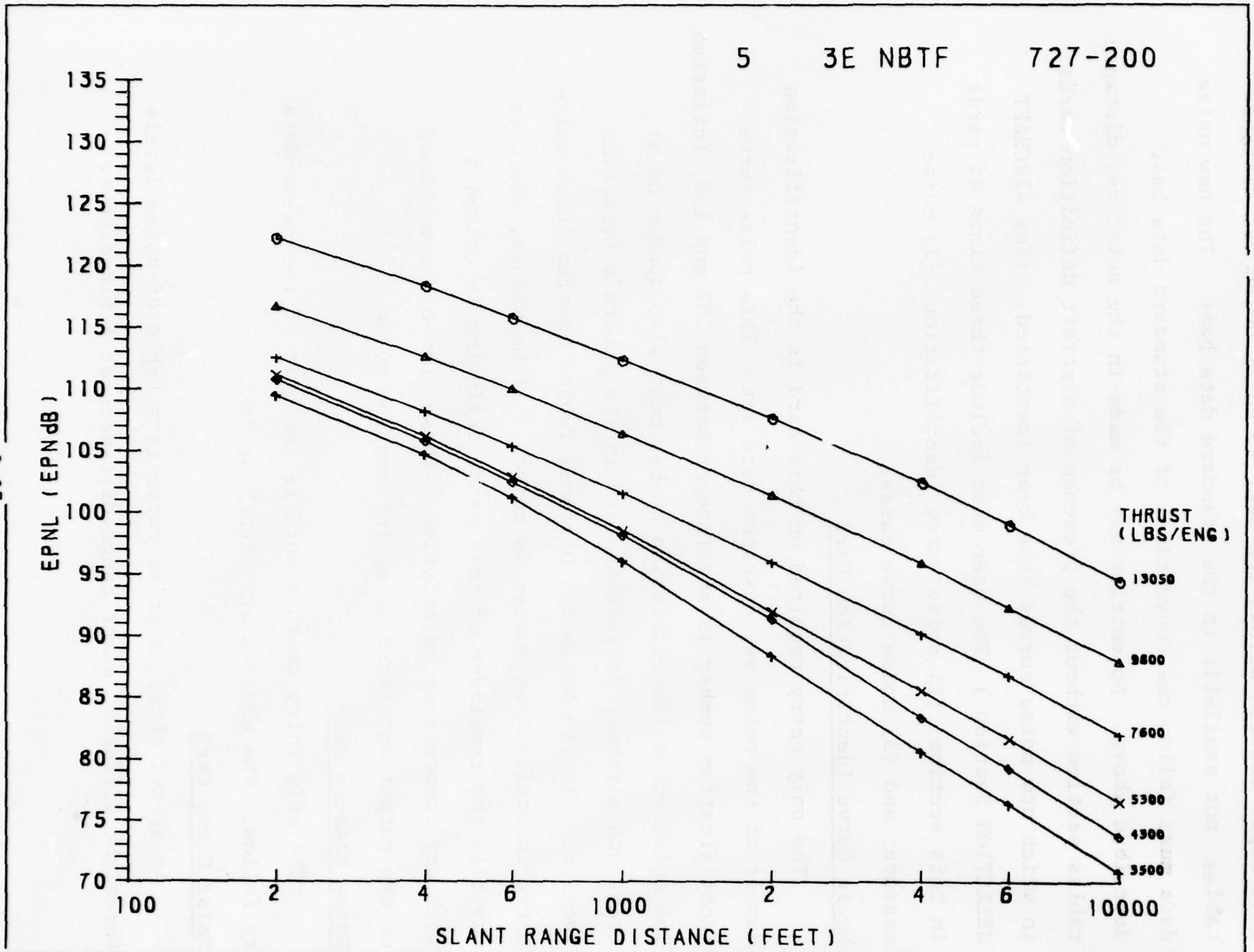


FIGURE 9.2.5-1 PLOT OF 727-200 EPNL NOISE CURVES

This input section allows the user to enter noise vs. distance tables not available in the standard data base. The new noise data must follow the conventions of the standard data base described above. No entries may be made in the noise vs. distance tables section without the presence of aircraft definition cards in which new noise curves have been identified. (See AIRCRAFT SELECTION Section.) The user must include three kinds of cards in this section: (1) noise curve identification, (2) noise measure, and (3) noise curve cards.

Noise Curve Identification Card

The only entry required on this card is the identification number of the noise vs. distance data set. This noise curve identification number is any integer between 101 and 150, inclusive. The noise curve identification number must also appear on at least one aircraft definition card in the Aircraft Selection Section. In the Noise vs. Distance Tables Section, each noise curve identification number is unique. If he wishes, the user may fill the remainder of this card, beginning in column 5, with any comments or description. These comments are echoed on the output and serve as an information guide.

Noise Measure Card

The only entry on this card is the unit of the noise data to follow. The choices are "EPNL" or "NEL."

Noise Curve Card

As stated above, a noise curve is a table of noise levels for eight different slant range distances at a fixed power

setting. Each noise vs. distance data set contains at least two but no more than six noise curves. Thus, the INM expects to read at least two noise curve cards at this time. Each noise curve card contains the power setting followed by eight values of EPNL or NEL depending upon the entry in the noise measure card. The noise curve cards are entered in decreasing order of power setting value. The unit of the first entry power setting can be any acceptable unit normally used to describe the power associated with aircraft performance. For all aircraft in the data base, it is thrust in pounds per engine. The unit of power must be consistent with that used in the other data sets associated with the same aircraft type. The next eight entries on this card are the noise levels in EPNL or NEL corresponding to the slant range distances of 200, 400, 600, 1000, 2000, 4000, 6000, and 10,000 feet respectively. The slant range distance is the distance between an observer on the ground and the aircraft. The user must not adjust the noise values which he is entering for the effects of engine shielding or attenuation of noise by the ground surface. These corrections are made by the model during execution.

After all these noise curve cards are completed, a blank card is added to signal the end of data for this particular noise measure. Each noise vs. distance data set contains at least two EPNL curves and at least two NEL curves. To complete the new data, the user must also enter data for the second noise measure. A second noise measure card is then provided. If "EPNL" was

entered on the earlier noise measure card, then "NEL" is entered on this card or vice versa. Noise curve cards follow this second noise measure card exactly as they did the first. The EPNL curves and the NEL curves must be referenced by the exact same power settings. Thus, the first entry on each of the noise cards in the second group must equal each of the first entries of the noise curve cards of the first group. It follows that the number of noise curve cards in the second group must equal the number of noise curve cards in the first group. After these noise curve cards are completed, a blank card is added to signal the end of this new noise vs. distance data set. If there are no other new noise vs. distance data sets, another blank card is added to signal the end of the Alternative Noise vs. Distance Tables Section. However, if there are additional noise data sets, this whole process is repeated beginning with a new noise curve identification card.

The standard data base contains a third unit of aircraft noise besides EPNL and NEL. TA is the time of exposure to aircraft noise above a specified A-weighted sound level threshold. Because of the complexity of the mathematical variables used to compute TA, the user cannot define his own TA data set. Each noise vs. distance data set in the standard data base is associated with a TA data set also in the standard data base. However, the user does not have the capability to associate a user-defined noise vs. distance data set with a TA data set. The INM will not calculate TA for those cases involving user created noise vs. distance data sets because the TA data sets for those particular aircraft types are missing. An example of this is given in the Output Section.

ALTERNATIVE NOISE VS. DISTANCE (OPTIONAL)

Columns	Description		Type
Noise Curve Identification Card			
1-3	noise curve identification number		101 < I < 150
4-79	comments		A
Noise Measure Card			
1-4	name of noise measure ("EPNL" or "NEL")		A
Noise Curve Card(s)			
1-8	power setting (i.e., thrust/engine in lbs.)		0 < R
9-15	at 200 ft. slant range	EPNL or NEL	0 < R
16-22	at 400 ft. slant range		
23-29	at 600 ft. slant range		
30-36	at 1000 ft. slant range		
37-43	at 2000 ft. slant range		
44-50	at 4000 ft. slant range		
51-57	at 6000 ft. slant range		
58-64	at 10,000 ft. slant range		

Type:

I - right justified integer
R - right justified integer or real number with a decimal point
A - alphanumeric

```
102           ALTERNATIVE NOISE VS DISTANCE SECTION
101           TABLES FOR AIRCRAFT Y
EPNL
30000.  105.  100.  95.   90.   85.   80.   75.   70.
20000.  100.  95.   90.   85.   80.   75.   70.   65.
10000.  95.   90.   85.   80.   75.   70.   65.   60.

NEL
30000.  100.  95.   90.   85.   80.   75.   70.   65.
20000.  95.   90.   85.   80.   75.   70.   65.   60.
10000.  90.   85.   80.   75.   70.   65.   60.   55.
```

9.2.6 AIRCRAFT MIX SECTION

The aircraft mix describes the type, magnitude and arrangement of activity at an airport. The input consists of the average number of day, evening, and night operations per day on tracks defined in the Airport Section. Day is the period between 7 a.m. and 7 p.m., evening is the period between 7 p.m. and 10 p.m., and night is between 10 p.m. and 7 a.m. The specification of time of day is an important factor in the calculation of four of the measures of airport noise which are available in the INM: NEF, Ldn, CNEL, and TA. The contribution of night operations to total exposure is more heavily weighted than the contribution of day operations for NEF, Ldn, and CNEL. The evening operations are more heavily weighted than the day operations but weighted less heavily than the night operations in the determination of total exposure as measured by CNEL. In Grid Analysis, TA calculations are broken down into three daily periods: total, evening, and night. (See Output Section.) The tabulation of operations is based on knowledge of schedule, demand,runway utilization, and air traffic control procedures in addition to the runway and track layout.

On each card the user may model all arrivals and departures of a single aircraft type on a particular track. The first entry is the aircraft identification number. This identifier must also appear in an aircraft retrieval card or an aircraft definition card. (See Aircraft Selection Section.) The next entry is the track identification number taken from a track definition card in the Airport Section. The third entry is the identification number

of an approach profile which was defined in the Profile Section. This field may be left blank if the specified aircraft type does not use the specified track for arrivals. The remaining 24 fields of the card are concerned with allocating operations. Three fields are associated with arrival and each of the seven departure trip lengths. The first three fields after the approach profile identification number entry are for arrivals and correspond to the time periods day, evening, and night, respectively. If a value appears in any of these three fields, then an approach profile identification number is required on this card. An aircraft can be associated with up to seven departure categories corresponding to trip lengths of 0-500 nautical miles, 500-1000 nautical miles, 1000-1500 nautical miles, 1500-2500 nautical miles, 2500-3500 nautical miles, 3500-4500 nautical miles, and greater than 4500 nautical miles. Each operation field relates to a time period, day,evening, or night, respectively, and each set of the three operation fields of day, evening, and night relates to a trip length. The user enters the average number of operations per day for each category. Most of the aircraft in the standard data base do not have takeoff profiles for all seven departure categories because of aircraft range limitations. The user can avoid incorrect departure entries by referring to Figure 9.2.2.1 or to the Data Base Report to determine the maximum range of a particular aircraft. The Aircraft Mix Section is closed by adding a blank card after the last mix card.

AIRCRAFT MIX

Columns	Description		Type
Mix Card(s)			
1-3	aircraft identification number		data base $101 \leq I \leq 150$
4-5	track identification number		$1 \leq I \leq 88$
6-8	approach profile identification number (if required)		$301 \leq I \leq 350$
9-11	day (0700-1900 HRS)	arrivals	R
12-14	evening (1900-2200 HRS)		
15-17	night (2200-0700 HRS)		
18-20	day	departures 0-500 n. mi. trip	R
21-23	evening		
24-26	night		
27-29	day	departures 500-1000 n. mi. trip	R
30-32	evening		
33-35	night		
36-38	day	departures 1000-1500 n. mi. trip	R
39-41	evening		
42-44	night		
45-47	day	departures 1500-2500 n. mi. trip	R
48-50	evening		
51-53	night		
54-56	day	departures 2500-3500 n. mi. trip	R
57-59	evening		
60-62	night		
63-65	day	departures 3500-4500 n. mi. trip	R
66-68	evening		
69-71	night		
72-74	day	departures 4500+ n. mi. trip	R
75-77	evening		
78-80	night		

Type: I - right justified integer
R - right justified integer of real number with decimal point
A - alphanumeric

```
100   3          AIRCRAFT MIX SECTION
  3 7             3. 1. 1. 2.1.5
  3 8                               3. 1. 1. 2.   1.5
  3 9301 9. 4. 4.
  5 6302 4. 3. 2. 2. 1.    2.  1.    2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.    1. 3.    1. 1.
 17 1301 5. 2. 1.                   3.    2.          2.    2.
 43 4            25. 5.10.
 43 230325. 5.10.
101 5302 8. 1. 1.                   8. 1. 1.
102 3301 4.       2.       1.       1.
```

9.2.7 TAKEOFF PROFILE MODIFICATION SECTION

Occasionally the user may desire to modify a set of standard takeoff profiles without the benefit of the substantial performance information required in the Profile Section. In this section the user can modify any portion of the standard profile using one of five types of modification, altitude restriction, takeoff power, climb power, engine-out level flight power, and specified climb gradient. The Takeoff Profile Modification Section does not apply to either the military or general aviation aircraft in the INM data base. The user must override the modifications for these aircraft with the procedure described below.

The standard takeoff procedure for commercial jet aircraft in the INM data base is one which was commonly used by the domestic airlines prior to December 1976. This procedure is still in use today despite the formalization of a different procedure by the Air Transport Association in December 1976. The standard INM procedure is described in Section 1.3.

A takeoff profile modification is assigned to one or more tracks. All departing aircraft on those track(s) are affected unless an override is used. The user may exclude any of the aircraft on the track from modification by using the first card which must appear in this section, the override card. Each column on the override card corresponds to a noise curve identification number such that column 1 corresponds to noise curve #1, column 2 to noise curve #2, and so on. The override card applies to only the aircraft types with noise curve identification numbers in the INM data base as shown

in Figure 9.2.2.1. The entries in each column of the override card are known as the override modes and are integers between zero and three, inclusive. The definitions of the override modes are:

0 (or blank) - accept any modification

1 - accept no modification of any type

2 - accept engine-out cutback only

3 - accept takeoff or climb power only

Thus, any aircraft departing on a track which is subject to profile modification can have full, partial or no exemption from the modification depending upon the override mode assigned to that particular aircraft's noise curve identification number.

The override card must appear first in this section and must be left blank if no overrides occur. It is followed by the modification definition cards. The modification definition card identifies the type of modification, the segment of the profiles to be modified and the track(s) subject to the modification. The first entry on this card is the modification ordinal identifier and is a unique integer between 1 and 25, inclusive. The second field must contain the modification type which is one of the following:

1 - Altitude restriction (the aircraft cannot exceed the assigned altitude).

2 - Takeoff power (the aircraft uses full power).

3 - Climb power (the aircraft uses maximum continuous climb power).

4 - Engine-out level flight power (the aircraft uses that power per engine which would maintain level flight if one engine was lost).

5 - Specified climb gradient (the aircraft will alter power to maintain the climb gradient).

The third field is used only if modification type "5" has been entered in the last field. The user enters the climb gradient in this field. Climb gradient is the ratio of the change in altitude to the change in ground distance in feet of climb over feet of distance. The fourth and fifth fields define the start point and end point, respectively, of the modification. These points are either altitudes, in feet, above the runway, or distances, in nautical miles, from start of takeoff roll. The model interprets an entry of less than 100 as a distance in nautical miles. Otherwise, the entry is assumed to be an altitude in feet. No modification can begin below an altitude of 700 feet or a distance from start of roll which corresponds to that altitude. The end point must be further from the start of takeoff roll than the modification start point. For modification type 1, the end must be a distance in nautical miles. After the end of the modification, the aircraft will resume the standard takeoff procedure. The final entries on the card are the up to ten track identification numbers (See Airport Section) to which the modification is applied. A track identification number cannot appear on more than one modification definition card. The Takeoff Profile Modification Section is closed by adding a blank card after the last modification definition card.

TAKEOFF PROFILE MODIFICATION (Optional)

Columns	Description	Type
Override Card		
1-80	override mode (each column corresponds to a noise curve number): 0(or blank) - accept any modification 1 - accept no modification 2 - accept engine-out power only 3 - accept takeoff or climb power only	$0 \leq I \leq 3$
Modification Definition Card(s)		
1-3	modification ordinal identifier	$1 \leq I \leq 25$
4-6	modification type: 1 - altitude restriction 2 - takeoff power 3 - climb power 4 - engine-out level flight power 5 - specified climb gradient	$1 \leq I \leq 5$
7-14	climb gradient (for type 5 only)	R
15-22	start point: if > 100; altitude in ft.	$700 < R$
	start point: if < 100; distance in n. mi.	R
23-30	end point: if > 100; altitude in ft.	$700 < R$
	end point: if < 100; distance in n. mi. (if type 1, must be distance in n. mi.)	R
31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71-75 76-80	track identification numbers (see AIRPORT Section)	$0 \leq I \leq 88$

Type: I - right justified integer; R - right justified integer or real number with a decimal point; A - alphanumeric

```
103            TAKEOFF PROFILE MODIFICATION SECTION
          1
  1  1          3000.      10.    3
  2  5     .04     3.    8000.    7    8
```

9.3 OUTPUT

The INM can generate either contour of equal noise exposure through the Contour Analysis Model or the values of all the available noise measures at specified locations through the Grid Analysis Model. Common to both the Contour and Grid Analysis is the echo of the input data.

9.3.1 ECHO OF INPUT DATA

Figure 9.3.1-1 is the echo of the airport, aircraft selection, profile, alternative aircraft data and aircraft mix sections of the example airport input file. In addition, the daily aircraft operations are tabulated and presented by aircraft type (Figure 9.3.1-2) and by runway (Figure 9.3.1-3).

The tabulated aircraft operations can be helpful as a check for the proper assignment of the aircraft mix. Shown are the aircraft identification number, associated aircraft name, the noise curve identification number, total number of day, evening and night arrivals, total number of day, evening and night departures by trip length categories and the takeoff profile identification numbers which appear to the left of each of the trip length total daily departures.

The runway utilization table is self-explanatory with the exception of "DEFAULT RUNWAY" and "TOTAL FLIGHTS." Even though a default runway is defined for any analysis, the value is only used in Contour Analysis. The default runway is the most heavily used takeoff runway and is specified by its runway ordinal identification and takeoff runway direction number. Unless otherwise requested, the first contour point is found by computing

```
                          FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
                   EXAMPLE AIRPORT S    ?IO GRID ANALYSIS

1000  1  0.000        AIRPORT SECTION


              AIRPORT ALTITUDE=     0. FT ABOVE MSL          AMBIENT TEMP= 15.DEG C

RUNWAY  1    10000.00      0.00       0.00       0.00        0.00       0.00   27  9 T.O. RWY 27        LENGTH = 10000.
RUNWAY  2        0.00      0.00       0.00   10000.00        0.00       0.00    9 27 T.O. RWY  9        LENGTH = 10000.
RUNWAY  3     7000.00  -7000.00       0.00    2000.00     2000.00       0.00   31 13 T.O. RWY 31        LENGTH = 10296.
RUNWAY  4     2000.00   2000.00       0.00    7000.00    -7000.00       0.00   13 31 T.O. RWY 13        LENGTH = 10296.
TRACK DATA  1 1 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  1 2 3    .50  45.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  3 3 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 4 5    .50  90.00  -1.50   1.50   0.00  45.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 5 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 6 3    .50  10.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 7 3    .50  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 8 3   1.00  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 9 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00

1070  0  0.000        AIRCRAFT SELECTION SECTION

THE FOLLOWING AIRCRAFT ARE RETRIEVED AS THEY APPEAR IN THE DATA BASE:
  3  5  8 43
NEW OR REPLACEMENT AIRCRAFT DEFINITIONS:
 AC     NAME                  NC APP    T. O. P R O F I L E S
 17   AIRCRAFT X              19 101  27  28  29  30  31  32  32
101   AIRCRAFT Y             101 102 201 201 202 202   0   0   0
102   AIRCRAFT Z              20  18  38  28  39  29   0   0   0

1010  0  0.000        PROFILE SECTION

PROFILE  18 (FEET)              REPLACEMENT B727-200 T.O. PROFILE
     0.00   5000.00  25000.00  50000.00  75000.00 100000.00 150000.00      0.00   0.00000      0.00
     0.00      0.00   2000.00   4500.00   7000.00   9500.00  14500.00      0.00   0.00000      0.00
    32.00    160.00    160.00    160.00    160.00    160.00    160.00      3.00   0.00000      0.00
 15000.00  15000.00  15000.00  15000.00  15000.00  15000.00      0.00 120000.00   0.00000      0.00
PROFILE 201 (FEET)              AIRCRAFT Y SHORT RANGE T.O. PROFILE
     0.00   5000.00  25000.00  50000.00  75000.00 100000.00 150000.00      0.00      0.00      0.00
     0.00      0.00   2000.00   4500.00   7000.00   9500.00  14500.00      0.00      0.00      0.00
    32.00    200.00    200.00    200.00    200.00    200.00    200.00      3.00      0.00      0.00
 30000.00  30000.00  30000.00  30000.00  30000.00  30000.00      0.00 300000.00      0.00      0.00
PROFILE 202 (FEET)              AIRCRAFT Y LONG RANGE T.O. PROFILE
     0.00  10000.00  20000.00  50000.00  70000.00 100000.00 150000.00      0.00      0.00      0.00
     0.00      0.00   2000.00   4000.00   6000.00   9000.00  14000.00      0.00      0.00      0.00
    32.00    250.00    250.00    250.00    250.00    250.00    250.00      3.00      0.00      0.00
 30000.00  30000.00  30000.00  30000.00  30000.00  30000.00      0.00 350000.00      0.00      0.00
PROFILE 301 (N.M.)            STANDARD 3 DEGREE APPROACH
    -1.00      -.17      2.98      5.26     12.40     18.68      0.00      0.00      0.00      0.00
     0.00      0.00   1000.00   3000.00   4000.00   5000.00      0.00      0.00      0.00      0.00
    32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
   -10.00     -3.00     -6.00     -6.00     -6.00      0.00      0.00      0.00      0.00      0.00
PROFILE 302 (N.M.)            STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
    -1.00      -.17      2.98      5.26     12.00     15.14      0.00      0.00      0.00      0.00
     0.00      0.00   1000.00   3000.00   3000.00   4000.00      0.00      0.00      0.00      0.00
    32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
   -10.00     -3.00     -6.00     -5.00     -6.00      0.00      0.00      0.00      0.00      0.00
```

FIGURE 9.3.1-1 ECHO OF INPUT

```
PROFILE 303 (N.M.)          6A. 3 DEGREE APPROACH
     -1.00      -.17      2.98      5.26     12.40     18.68      0.00      0.00      0.00      0.00
      0.00      0.00   1600.00   3000.00   4000.00   5000.00      0.00      0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
     -3.00     -3.00     -3.00     -3.00     -3.00      0.00      0.00      0.00      0.00      0.00

1080  0  0.000      ALTERNATIVE APPROACH PARAMETERS SECTION

APPROACH PARAMETERS
                                                 *THRUSTS*
TYPE  AIRCRAFT   LDG ROLL    SPEED     3 DEG L   6 DEG L   LEVEL A   3 DEG A   LEVEL M  500FT/NM     IDLE   REVERSE    WEIGHT  NF
101 ACFT X          5000.      150.    10000.        0.        0.    10000.        0.        0.        0.    15000.   100000.  4.
102 ACFT Y          3000.      180.    15000.     8000.    10000.    12000.     7000.     7500.     4000.    20000.   200000.  3.

1020  0  0.000      ALTERNATIVE NOISE VS DISTANCE SECTION

NOISE CURVE NUMBER 101              TABLES FOR AIRCRAFT Y
                                       VALUES OF EPNL
   THRUST     200 FT    400 FT    600 FT   1000 FT   2000 FT   4000 FT   6000 FT  10000 FT
   30000.0    105.00    100.00     95.00     90.00     85.00     80.00     75.00     70.00
   20000.0    100.00     95.00     90.00     85.00     80.00     75.00     70.00     65.00
   10000.0     95.00     90.00     85.00     80.00     75.00     70.00     65.00     60.00
                                       VALUES OF NEL
   THRUST     200 FT    400 FT    600 FT   1000 FT   2000 FT   4000 FT   6000 FT  10000 FT
   30000.0    100.00     95.00     90.00     85.00     80.00     75.00     70.00     65.00
   20000.0     95.00     90.00     85.00     80.00     75.00     70.00     65.00     60.00
   10000.0     90.00     85.00     80.00     75.00     70.00     65.00     60.00     55.00

1000  3  0.000        AIRCRAFT MIX SECTION


MIX DATA
              *                   *                   *                   *                   *                   *                   *                   *
  3  7   0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3  8   0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  0.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3  9 301  9.0  4.0  4.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  5  6 302  4.0  3.0  2.0  2.0  1.0  0.0  2.0  1.0  0.0  2.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  8  3 301 10.0  2.0  5.0  5.0  1.0  3.0  2.0  0.0  1.0  3.0  0.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 17  1 301  5.0  2.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  2.0  0.0  2.0  0.0  0.0  0.0  2.0  0.0  2.0  0.0  0.0  0.0  0.0  0.0  0.0
 43  4   0  0.0  0.0  0.0 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 43  2 303 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
101  5 302  8.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  8.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
102  3 301  4.0  0.0  0.0  2.0  0.0  0.0  1.0  0.0  0.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0

                             FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
                       EXAMPLE AIRPORT SCENARIO GRID ANALYSIS                                                       07/30/79.

 A/C   A/C NAME              NC      ARRIVALS      0- 500    500-1000   1000-1500  1500-2500  2500-3500  3500-4500  4500- UP

   3            BAC-111       2  D        9.0  48    3.0  49    2.0  49    3.0  49    2.0   0    0.0   0    0.0   0    0.0
                                 E        4.0        1.0        1.5        1.0        0.0        0.0        0.0        0.0
                                 N        4.0        1.0        0.0        1.0        1.5        0.0        0.0        0.0

   5 3E NBTF    727-200       8  D        4.0  18    2.0  20    2.0  20    2.0  20    0.0   0    0.0   0    0.0   0    0.0
                                 E        3.0        1.0        1.0        1.0        0.0        0.0        0.0        0.0
                                 N        2.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0

   8           707-120B      11  D       10.0  38    5.0  39    2.0  40    3.0  41    1.0  42    0.0  42    0.0  42    0.0
                                 E        2.0        1.0        0.0        0.0        0.0        0.0        0.0        0.0
                                 N        5.0        3.0        1.0        1.0        0.0        0.0        0.0        0.0

  17  AIRCRAFT X             19  D        5.0  27    0.0  28    0.0  29    2.0  30    0.0  31    2.0  32    0.0  32    0.0
                                 E        2.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
                                 N        1.0        0.0        0.0        2.0        0.0        2.0        0.0        0.0
```

FIGURE 9.3.1-1 ECHO OF INPUT(CONT)

MIX DATA

3	7	0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	9	301	9.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	6	302	4.0	3.0	2.0	2.0	1.0	0.0	2.0	1.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	3	301	10.0	2.0	5.0	5.0	1.0	3.0	2.0	0.0	1.0	3.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	1	301	5.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
43	4	0	0.0	0.0	0.0	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	2	303	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102	3	301	4.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO GRID ANALYSIS W/O AIRCRAFT 101 07/30/79.

A/C	A/C NAME		NC		ARRIVALS		0- 500		500-1000		1000-1500		1500-2500		2500-3500		3500-4500		4500- UP
3		BAC-111	2	D	9.0	48	3.0	49	2.0	49	3.0	49	2.0	0	0.0	0	0.0	0	0.0
				E	4.0		1.0		1.5		1.0		0.0		0.0		0.0		0.0
				N	4.0		1.0		0.0		1.0		1.5		0.0		0.0		0.0
5	3E N8TF	727-200	8	D	4.0	18	2.0	20	2.0	20	2.0	20	0.0	0	0.0	0	0.0	0	0.0
				E	3.0		1.0		1.0		1.0		0.0		0.0		0.0		0.0
				N	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
8		707-120B	11	D	10.0	38	5.0	39	2.0	40	3.0	41	1.0	42	0.0	42	0.0	42	0.0
				E	2.0		1.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	5.0		3.0		1.0		1.0		0.0		0.0		0.0		0.0
17	AIRCRAFT X		19	D	5.0	27	0.0	28	0.0	29	2.0	30	0.0	31	2.0	32	0.0	32	0.0
				E	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	1.0		0.0		0.0		2.0		0.0		2.0		0.0		0.0
43	MSEP6		26	D	25.0	91	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
				E	5.0		5.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	10.0		10.0		0.0		0.0		0.0		0.0		0.0		0.0
102	AIRCRAFT 7		20	D	4.0	38	2.0	28	1.0	39	1.0	29	0.0	0	0.0	0	0.0	0	0.0
				E	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

FIGURE 9 `.1-2 TABULATION OF AIRCRAFT OPERATIONS BY TYPE

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO GRID ANALYSIS WITHOUT AIRCRAFT 101

RUNWAY UTILIZATION

RUNWAYS-		27	9	31	13	TOT
TAKEOFFS (ACTUAL)	D	4.0	31.0	15.0	10.0	60.0
	E	0.0	8.0	1.0	3.5	12.5
	N	4.0	10.	5.0	3.5	22.5
TAKEOFFS (PERCENT)	D	4.2	32.6	15.8	10.5	
	E	0.0	8.4	1.1	3.7	
	N	4.2	10.5	5.3	3.7	
LANDINGS (ACTUAL)	D	4.0	30.0	9.0	14.0	57.0
	E	3.0	7.0	4.0	2.0	16.0
	N	2.0	11.0	4.0	5.0	22.0
LANDINGS (PERCENT)	D	4.2	31.6	9.5	14.7	
	E	3.2	7.4	4.2	2.1	
	N	2.1	11.6	4.2	5.3	

TOTAL TAKEOFFS 95.0 LANDINGS 95.0

TOTAL OPERATIONS - DAILY 190. - YEARLY 69350.
DEFAULT RUNWAY 2 9

TOTAL FLIGHTS 21

1030 0 0.000 TAKEOFF PROFILE MODIFICATION SECTION

```
ALTITUDE RESTRICTION/CUTBACK DATA
C/B OVERRIDE ARRAY:0000000000100000000000000000000000000000000000
RESTRICTION   1   1    0.00000  3000.00000    10.00000   3  0  0  0  0  0  0  0  0  0
RESTRICTION   2   5     .04000     .00000   8000.00000   7  8  0  0  0  0  0  0  0  0

 00  0  0.000
```

FIGURE 9.3.1-3 RUNWAY UTILIZATION TABLE

noise values on a line coincident with the default runway centerline until the contour value is found. The echo of the optional takeoff profile modification section also appears on the page of this output.

Fictitious values for the number of landings (51994.0) and landing percentages ("*****") can appear in the runway utilization table. The proper entries for the runway direction numbers on the runway definition cards will eliminate this problem. (See Airport Section.) The takeoff runway direction number is a right-justified entry in columns 58-60. The landing runway direction number is a right-justified entry in columns 61-63.

9.3.2 INPUT ERROR MESSAGES

The INM contains a substantial amount of error checking. Fatal error messages indicate that the model will not execute until a correction is implemented. Warning messages indicate that the data appears to be illogical but is still possibly correct. This section describes various input error messages, their severity, their probable causes and possible corrective measures.

1. <u>THIS VERSION OF INM WILL NOT EXECUTE USING DATA BASES NO 50 OR GREATER</u>

   Severity: Fatal

   Cause: An attempt was made to execute the INM with an invalid data base (logical unit 7).

   Correction: Use a valid INM data base.

2. <u>ERROR IN INPUT DATA</u>

Severity: Fatal

Cause: This message is usually printed after other explanatory messages. If not, then the last card read is in error.

Correction: If it was the last card, determine the error and correct it.

3. <u>CONTROL CARD ERROR</u>

Severity: Fatal

Cause: Unrecognizable card in an input control card position.

Correction: Replace card with valid input control card.

4. <u>ILLEGAL RUNWAY NUMBER</u>

Severity: Fatal

Cause: Runway identification number not in 1 to 15 range.

Correction: Use number in proper range.

5. <u>RUNWAY HAS NOT BEEN DEFINED</u>

Severity: Fatal

Cause: In Input Sections subsequent to the Airport Section, a runway identification number is used which was not defined in the Runway Definition Card(s).

Correction: Either replace undefined runway identification number or add new Runway Definition Card(s).

6. TRACK NUMBER IS IN ERROR

Severity: Fatal

Cause: Track identification number not in the range 1 to 88.

Correction: Use number in proper range.

7. NUMBER OF SEGMENTS IN ERROR

Severity: Fatal

Cause: Number of track segments not in the range 1 to 15.

Correction: Redefine track.

8. 2ND SEGMENT MUST BE A TURN

Severity: Fatal

Cause: Second segment in a track was defined as being straight.

Correction: Redefine second segment.

9. TURN OVER 270 DEGREES ILLEGAL

Severity: Fatal

Cause: Self explanatory.

Correction: Define a short straight segment in the middle of the turn.

10. CONSEC TURNS OVER 270 DEGREES

Severity: Fatal

Cause: Two consecutive turns create a turn of more than 270 degrees.

Correction: Define short straight segment between the turns.

11. TURN NOT BOUNDED BY ST. SGMTS.

Severity: Fatal

Cause: Turns of 180 degrees or more are required to be bounded by straight segments.

Correction: Add straight segments.

12. 3 CONSEC. TURNS IN SAME DIREC.

Severity: Fatal

Cause: Three consecutive turns in same direction were present in a track definition.

Correction: Define a short straight segment between two of the turns.

13. NEGATIVE GRADIENT IN PROFILE XX

Severity: Fatal

Cause: The correction of an aircraft departure profile for airport altitude has caused the aircraft to descend rather than climb for particular profile segments. This message is followed by a line of seven ground distances from start of takeoff roll and a line of the aircraft altitudes corresponding to these distances.

Correction: Remove the profile in error.

14. *FATAL: ILLEGAL PROFILE I.D. - XX

Severity: Fatal

Cause: Takeoff profile identification number greater than any in the standard data base or not in range of 201 to 250 for user defined profiles.

Correction: Change to a correct number.

15. <u>FATAL: ILLEGAL NOISE CURVE I.D. - XX</u>

Severity: Fatal

Cause: Noise curve identification number greater than any in standard data base or not in range of 101 to 150 for user defined noise curves.

Correction: Change to a correct number.

16. <u>FATAL: ILLEGAL APPROACH PARAMETER I.D. - XX</u>

Severity: Fatal

Cause: Approach parameter set identification number is greater than any in the standard data base or not in range of 101 to 150 for user defined approach parameter sets.

Correction: Change to a correct number.

17. <u>FATAL: ILLEGAL AIRCRAFT DEFINITION - NO. XX</u>

Severity: Fatal

Cuase: Aircraft identification number is greater than any in standard data base or not in the range of 101 to 150 for user defined aircraft.

Correction: Change to correct number.

18. <u>*FATAL: REPLACEMENT OR NEW AIRCRAFT I.D. NUMBERS MUST BE STRICTLY INCREASING</u>

Severity: Fatal

Cause: Aircraft definition cards not sorted in ascending order.

Correction: Reorder aircraft definition cards.

19. ERROR IN PROFILE NUMBER - XX

Severity: Fatal

Cause: Profile identification number is greater than any takeoff profile number in standard data base or not in the range of 201 or 250 for user defined takeoff profiles or not in the range 301 to 350 for landing profiles.

Correction: Change to correct number.

20. DISTANCE NUMBER XX ABOVE IS SUSPECT
ALTITUDE NUMBER XX ABOVE IS SUSPECT
VELOCITY NUMBER XX ABOVE IS SUSPECT

Severity: Warning

Cause: Value in segment XX of a profile appears to be incompatible with other values. The velocity indicators are not checked.

Correction: Correct data if necessary.

21. *FATAL: ZERO TAKEOFF WEIGHT ENCOUNTERED, CHECK 8TH FIELD OF THRUST CARD

Severity: Fatal

Cause: Self-explanatory

Correction: Add a takeoff weight in pounds.

22. ILLEGAL APPROACH PARAMETER NO.

Severity: Fatal

Cause: Approach parameter number greater than any in the standard data base or not in the range 101 to 150 for user defined approach parameter sets.

Correction: Change to a correct number.

23. <u>ERROR IN GROUND ROLL DISTANCE</u>

Severity: Fatal

Cause: Ground roll, or stop, distance is zero.

Correction: Enter a ground roll distance.

24. <u>ERROR IN NUMBER OF ENGINES</u>

Severity: Fatal

Cause: Specified number of engines are zero or negative.

Correction: Set this entry equal to the number of engines for the aircraft under consideration.

25. <u>ERROR IN NOISE CURVE NUMBER</u>

Severity: Fatal

Cause: Noise curve set number not in range 101 to 150

Correction: Change to a correct number.

26. <u>NOTE: THIS NOISE CURVE IS NOT USED</u>

Severity: Warning

Cause: A noise curve has been defined that is not used.

Correction: For efficiency, remove the noise curve data if not required.

27. <u>TABLES MUST BE EITHER EPNL OR NEL</u>

Severity: Fatal

Cause: A keyword other than "EPNL" or "NEL" has been used in noise measure card.

Correction: Change keyword to "EPNL" or "NEL."

AD-A079 493 FEDERAL AVIATION ADMINISTRATION WASHINGTON DC OFFICE --ETC F/G 1/2

INTEGRATED NOISE MODEL (INM). VERSION 2. USER'S GUIDE,(U)

SEP 79 T CONNOR, R HINCKLEY

UNCLASSIFIED FAA-AEE-79-09 NL

4 OF 5

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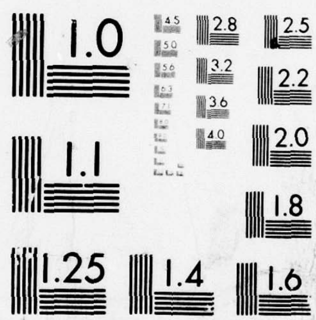


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

28. <u>THRUSTS OR NOISE VALUES NOT IN PROPER ORDER</u>

Severity: Fatal

Cause: The entries of thrust and noise levels must be monotonically decreasing in value.

Correction: Reorder the entries.

29. <u>EPNL AND NEL THRUST VALUES MUST MATCH</u>

Severity: Fatal

Cause: Corresponding thrusts are not equal.

Correction: Correct the data.

30. <u>TRACK NUMBER IS IN ERROR</u>

Severity: Fatal

Cause: Track identification number is not in the range of 1 to 88.

Correction: Change to correct number.

31. <u>ONE OR MORE TRACKS NOT DEFINED</u>

Severity: Fatal

Cause: One or more tracks have number of segments not in the range of 1 to 15.

Correction: Change to correct number of segments.

32. <u>FATAL: AIRCRAFT XX NOT REQUESTED OR NOT DEFINED</u>

Severity: Fatal

Cause: An aircraft mix card requests an aircraft not previously retrieved or defined.

Correction: Correct mix card or add aircraft identification to Aircraft Selection Section.

33. ERROR IN PROFILE NUMBER

Severity: Fatal

Cause: Track number has not been specified.

Correction: Enter the track number or remove that mix card.

34. ABOVE TRACK IS NOT DEFINED

Severity: Fatal

Cause: A track number has been referenced but has not been defined in Airport Section.

Correction: Define the track or remove the reference.

35. 2000 FLIGHT COMBINATIONS EXCEEDED

Severity: Fatal

Cause: Too many flights for internal storage allocations.

Correction: Delete the least significant assignments of aircraft types to tracks.

36. PROFILE NOT PROPERLY DEFINED

Severity: Fatal

Cause: A profile has been referenced but has not been properly defined in the Profile Section.

Correction: Define the profile or remove the reference.

37. THE AIRCRAFT ABOVE HAS BEEN ASSIGNED A TRIP LENGTH WHICH IS NOT COMMENSURATE WITH ITS MAXIMUM RANGE CAPABILITY

Severity: Warning

Cause: Departures have been assigned at a trip length which has been defined as outside the range of the aircraft.

Correction: INM automatically assigns the operations to the profile defined for maximum range of the aircraft.

38. <u>WARNING - RUNWAY LENGTH TOO SHORT FOR STAGE LENGTH XX ASSIGNMENT</u>

Severity: Warning

Cause: Takeoff roll exceeds the length of the runway.

Correction: INM does not take any action on this. If the aircraft does operate over that range from this airport, then compare the INM takeoff weight associated with the profile with the actual takeoff weight. If differences do exist then use the takeoff profile which most closely matches the actual weight. Otherwise, no action is necessary.

39. <u>PROFILE NOT IN STANDARD FORM</u>

Severity: Fatal

Cause: A takeoff modification has been requested and a profile numbered in the range 1 to 85 is not in standard form.

Correction: Remove or override the modification.

40. <u>OVERRIDE VALUE ABOVE IN ERROR</u>

Severity: Fatal

Cause: Takeoff modification override indicator is not in the range 0 to 3.

Correction: Change to a correct number.

41. RESTRICTION XX IS INVALID

Severity: Fatal

Cause: The end of a level flight cutback is specified as an altitude or no climb gradient is specified for a "Type 5" modification.

Correction: Specify end of level flight segment in terms of nautical miles from start of roll, or specify the desired climb gradient.

42. *FATAL: NUMBER OF ENGINES CANNOT BE ZERO, CHECK APPROACH DATA XX

Severity: Fatal

Cause: Zero engines defined on user defined approach parameter set XX.

Correction: Enter number of engines in Alternative Approach Parameter Section.

43. *FATAL: THRUST VALUE FOR INDICATOR - 3, XX FOR AIRCRAFT XX AND APPROACH DATA XX IS NOT CLOSE TO REFERENCE THRUSTS IN NOISE CURVE XX

Severity: Fatal

Cause: 3^{o} landing thrust not acceptable in comparison with the thrust values of the noise curves for the same aircraft type.

Correction: Correct user defined thrust data.

44. *FATAL: DISCREPANCY IN NUMBER OF ENGINES FOR AIRCRAFT XX FOR PROFILE XX FOR APPROACH DATA XX

Severity: Fatal

Cause: Inconsistency in number engines defined in a takeoff profile and number of engines in the approach parameter data set for that aircraft.

Correction: Correct the number of engines.

45. <u>FATAL: TAKEOFF THRUST IN SEGMENT XX OF PROFILE XX FOR AIRCRAFT XX IS NOT CLOSE TO REFERENCE THRUSTS IN NOISE CURVE XX</u>

Severity: Fatal

Cause: Inconsistency between the thrust values of the defined takeoff profile and the thrust values of the noise curves.

Correction: Correct the thrust values.

9.3.3 CONTOUR ANALYSIS

The Contour Analysis Model can calculate the points of equal noise exposure for any one of four cumulative measures of aircraft noise, NEF, Ldn, Leq, and CNEL. One of the outputs (logical unit 2) of this model is then processed by the Contour Plot program to produce plots of the cumulative metric contours. The other output (logical unit 6) consists of the echo of input which was described earlier, the interpretation of the process control cards, and tables of contour points.

9.3.4 CONTOUR PROCESS CONTROL CARDS

A minimum of three cards are added to the input file to create a contour analysis input file.

The metric card is inserted below the title card and becomes the second card in the input file. The metric card contains the choice of cumulative energy noise measure. Only one noise measure can be specified for each execution. The noise measure entries are identified by unique keywords as follows:

NEF = Noise Exposure Forecast

LDN = Day-Night Average Sound Level

LEQ = Equivalent Sound Level

CNEL = Community Noise Equivalent Level

The keyword is entered beginning in the first column of the metric card. At the end of the input file, after all the input sections, the contour card is added. Two blank cards must separate the contour card from the last valid entry of the Aircraft Mix Section or the Takeoff Profile Modification Section if that option is used. The contour card consists of the keyword "CONTOUR" in the first seven columns of that card. One or more contour value cards immediately follows the contour card. The contour value card specifies the level of the desired contour and other information which will assist in the calculation of the contour. The first entry is the value of the desired contour in the units of the noise metric. If the entry is positive, then the model expects other contour value cards to follow. A negative entry indicates the end of the contour value cards. The second entry is an indicator for checking the existance of discrete "islands" of equal noise exposure. A non-zero entry starts the process. The third entry is the contour value tolerance in decibels. If no entry is made, the tolerance is assumed to be 0.1. The next two entries identify a desired starting point. The entries are the X- and Y- coordinates, in feet, with reference to the specified origin. If no entries are made, the first point is found by the procedure using the default runway.(See Echo of Input Data.) The sixth entry is the maximum step size. The default step size is determined by the model as a function of the contour value. The next two entries are the X- and Y-

coordinates of the desired stopping point. This option is only used if the desire is to terminate a contour prior to completion. The last entry is the maximum number of contour points. The default value is 250 points. The user should pay special attention to an entry here. If the maximum number of points has been exceeded for a contour and the contour closing point is not within five steps of the last computed point, the execution will terminate. This situation does arise when a relatively low contour value is requested for a heavily active airport. The absolute maximum number of points which can be requested is 650. The user can specify up to ten contour value cards and the cards are entered in ascending order. Again, the last contour value card must contain a negative contour value entry. The last card of the contour analysis input file must contain "END" in first three columns. Figure 9.3.4.1 presents a complete contour analysis input file for the calculation of NEF 30 and 40 contours using all the processing defaults.

Figure 9.3.4.2 is an example of the echo of a processing card which would appear on a contour analysis output. The phrase "AUTO-START" indicates that the user has elected to have the model find the first contour point rather than specifying a start point.

9.3.5 CONTOUR ANALYSIS OUTPUT

Figures 9.3.5.1 and 9.3.5.2 show examples of an abbreviated printed output of equal noise exposure values produced by Contour Analysis for NEF 30. Most of the tabular headings are self-explanatory. "FLTS USED" indicates the number of the most

CONTOUR ANALYSIS CONTROL

(Append to the end of the input file. Two blank cards must separate these cards from the last valid input card. The second card in the input file must contain "NEF", "LDN", "LEQ" or "CNEL" beginning in the first column.)

Columns	Description		Type
Contour Card			
1-7	"CONTOUR"		A
Contour Value Card(s)			
1-5	contour value (last one must be negative)		R
6-10	indicator (if non zero then check for "islands")		I
11-20	contour value tolerance (default = 0.1 dB)		$0 < R$
21-30	starting X coordinate in ft.	(default is AUTO-START)	R
31-40	starting Y coordinate in ft.		
41-50	maximum step size in ft.		R
51-60	stopping X coordinate in ft.	(default is return to first point)	R
61-70	stopping Y coordinate in ft.		
71-79	maximum number of contour points (default = 250)		$0 < R \leq 650$
End Card			
1-3	"END"		A

Type:
- I - right justified integer
- R - right justified integer or real number with a decimal point
- A - alphanumeric

```
CONTOUR
30.0
-40.0
END
```

```
EXAMPLE AIRPORT SCENARIO
NEF
100   1          AIRPORT SECTION
       0.        15.0
  1   10000.       0.                 0.        0.           27  9 T.O. RWY 27
  2       0.       0.             10000.        0.            9 27 T.O. RWY  9
  3    7000.    -7000.             2000.     2000.           31 13 T.O. RWY 31
  4    2000.     2000.             7000.    -7000.           13 31 T.O. RWY 13

 1 1 1  50.
 1 2 3   .5  45.  1.5  50.
 3 3 1  50.
 2 4 5   .5  90. -1.5  1.5   0.  45. -1.5  50.
 2 5 1  50.
 2 6 3   .5  10.  1.5  50.
 4 7 3   .5  30. -1.5  50.
 4 8 3  1.0  30. -1.5  50.
 4 9 1  50.

107              AIRCRAFT SELECTION SECTION
 3, 5, 8,43
 17 AIRCRAFT X                    29 29 29
101 AIRCRAFT Y          101102201201202202  0  0  0
102 AIRCRAFT Z           20 18 38 28 39 29

101              PROFILE SECTION
 18  1             REPLACEMENT B727-200 T.O. PROFILE
0.       5000.   25000.  50000.  75000.  100000. 150000.
0.       0.      2000.   4500.   7000.   9500.   14500.
32.      160.    160.    160.    160.    160.    160.     3.
15000.   15000.  15000.  15000.  15000.  15000.           120000.
201  1           AIRCRAFT Y SHORT RANGE T.O. PROFILE
0.       5000.   25000.  50000.  75000.  100000. 150000.
0.       0.      2000.   4500.   7000.   9500.   14500.
32.      200.    200.    200.    200.    200.    200.     3.
30000.   30000.  30000.  30000.  30000.  30000.           300000.
202  1           AIRCRAFT Y LONG RANGE T.O. PROFILE
0.       10000.  20000.  50000.  70000.  100000. 150000.
0.       0.      2000.   4000.   6000.   9000.   14000.
32.      250.    250.    250.    250.    250.    250.     3.
30000.   30000.  30000.  30000.  30000.  30000.           350000.
301            STANDARD 3 DEGREE APPROACH
    -1.0   -.165   2.975   9.255  12.395  18.675
     0.0    0.0   1000.   3000.   4000.   5000.
     32.    -2.     -2.     -2.     -2.     -2.
    -10.    -3.     -6.     -6.     -6.
302            STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
    -1.0   -.165   2.975   9.255     12.   15.14
     0.0    0.0   1000.   3000.   3000.   4000.
     32.    -2.     -2.     -2.     -2.     -2.
    -10.    -3.     -6.     -5.     -6.
303            GA. 3 DEGREE APPROACH
    -1.0   -.165   2.975   9.255  12.395  18.675
     0.0    0.0   1000.   3000.   4000.   5000.
     32.    -2.     -2.     -2.     -2.     -2.
     -3.    -3.     -3.     -3.     -3.

108              ALTERNATIVE APPROACH PARAMETERS SECTION
101
ACFT X      100000.   4.
5000.   150.   10000.                  10000.                                15000.
102
ACFT Y      200000.   3.
3000.   100.    15000.  8000.    10000.  12000.  7000.   7500.   4000.   20000.

102              ALTERNATIVE NOISE VS DISTANCE SECTION
101              TABLES FOR AIRCRAFT Y
EPNL
30000.  105.    100.    95.     90.     85.     80.     75.     70.
20000.  100.    95.     90.     85.     80.     75.     70.     65.
10000.  95.     90.     85.     80.     75.     70.     65.     60.

NEL
30000.  100.    95.     90.     85.     80.     75.     70.     65.
20000.  95.     90.     85.     80.     75.     70.     65.     60.
10000.  90.     85.     80.     75.     70.     65.     60.     55.


100   3             AIRCRAFT MIX SECTION
  3 7               3. 1. 1. 2.1.5
  3 8                             3. 1. 1. 2.   1,5
  3 9301 9. 4. 4.
  5 6302 4. 3. 2. 2. 1.    2. 1.    2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.    1. 3.    1. 1.
 17 1301 5. 2. 1.                 2.    2.              2.    2.
 43 4               25. 5.10.
 43 230325. 5.10.
101 5302 8. 1. 1.                 8. 1. 1.
102 3301 4.       2.        1.    1.

103              TAKEOFF PROFILE MODIFICATION SECTION
          1
 1 1            3000.     10.    3
 2 5     .04       3.   8000.    7    8


CONTOUR
30.
-40.
END
```

FIGURE 9.3.4-1 CONTOUR ANALYSIS INPUT FILE - NEF

```
FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO

CONTOUR VALUE  30.00
TOLERANCE  .100
START POINT          0.00          0.00   AUTO-START
STEP SIZE      1165.00
STOP POINT          0.00        0.00
MAX. POINTS    250
ERROR CODE       0
```

FIGURE 9.3.4-2 INTERPRETATION OF THE CONTOUR PROCESSING DIRECTIONS

significant flights used to calculate the contour value at that point. The last column "ITERATIONS" indicates the number of tries it took to find the point.

Figure 9.3.5.1 shows the start of the NEF 30 contour and Figure 9.3.5.2 shows the end of the same contour. A successfully completed contour will have the last point identical to the first point and will end with the message "THE PREVIOUS CONTOUR IS NUMBER XX IN FILE NUMBER 2" as shown.

Contour Plots

The Contour Plot Program is designed to access the file of contour points generated by the Contour Analysis Model onto logical unit 2 and to produce plots of the retrieved contour points. A contour plot can be produced at varying scales. Two plotting programs are offered on the standard INM package to utilize either CALCOMP software or ZETA software. The plotting of contours is achieved by a sequence of process control cards on an input file. The first card contains the entries of the keyword "TAPES" and the logical unit number of the contour points file. Unit 2 is required on the standard package. The two entries on the second card are the keywords "PLOT" and the logical unit number for the plot file. Unit 8 is required on the standard package. The third card identifies the plotter size, plot scale and plot orientation. The first entry is the keyword "PLOTVAR," the second entry is the width of the plotting area, the third entry is the scale of the plots in feet per inch and the fourth entry is the angular rotation of the axis from the reference 0 degrees. If a study requires both contour and grid

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
1	19843.8	0.0	29.95	0.00	14	14
2	20938.2	-373.9	29.95	.13	14	7
3	22035.6	-735.0	30.01	.26	14	7
4	23169.1	-1004.0	29.95	.35	14	5
5	24301.0	-1280.0	29.96	.45	14	5
6	25429.6	-1569.0	29.92	.55	14	5
7	26522.6	-1950.1	30.06	.69	14	7
8	26902.2	-2391.9	30.05	.89	14	10
9	26327.8	-2488.5	30.10	.96	14	11
10	25162.8	-2477.0	29.94	1.00	14	5
11	24007.9	-2354.0	30.01	1.00	14	7
12	22848.6	-2239.2	29.98	1.00	14	5
13	21690.9	-2109.1	29.95	.99	14	5
14	20535.5	-2078.8	29.97	1.03	14	7
15	19382.2	-2014.7	29.97	1.04	14	7
16	18225.[illegible]	-1878.8	29.96	1.04	14	5
17	17068	-1768.2	29.95	1.05	14	7
18	15915	-1689.0	29.98	1.06	14	7
19	14759.[illegible]	-1544.4	29.97	1.05	14	5
20	13604.2	-1438.7	30.00	1.05	14	7
21	12440.3	-1388.1	30.01	1.07	14	5
22	11276.2	-1343.9	30.01	1.09	14	5
23	10111.7	-1308.5	30.10	1.11	14	5
24	8956.7	-1233.5	29.94	1.12	14	7
25	7803.4	-1298.2	29.94	1.16	14	7
26	7272.7	-1504.6	29.98	1.20	14	10
27	7163.6	-2076.8	30.06	1.28	14	10
28	7636.9	-3141.3	29.90	1.40	14	7
29	8270.4	-4108.3	29.97	1.49	14	7
30	9009.9	-4996.5	29.98	1.57	14	7
31	9877.5	-5774.0	29.95	1.62	14	5
32	10253.9	-6866.7	29.99	1.77	14	7
33	10467.7	-8007.2	29.99	1.96	14	7
34	10801.9	-9113.5	29.98	2.12	14	7
35	11298.9	-10160.8	29.99	2.24	14	7
36	11894.5	-11156.4	30.00	2.33	14	7
37	12502.2	-12139	29.99	2.42	14	7
38	13282.4	-12998.5	30.00	2.44	14	7
39	14092.7	-13835.5	29.99	2.45	14	5
40	14720.9	-14816.6	30.09	2.55	14	5
41	15543.0	-15632.2	30.00	2.54	14	7
42	16332.8	-16488.6	29.95	2.56	14	5
43	16796.1	-17557.6	30.00	2.74	14	7
44	16235.1	-17714.5	30.09	2.96	14	11
45	15080.0	-17724.8	30.01	3.33	14	7
46	14537.0	-17872.4	29.99	3.54	14	9
47	14492.9	-18439.6	29.96	3.70	14	11
48	14848.7	-19538.5	29.95	3.87	14	7
49	15273.7	-20623.2	30.06	4.01	14	5
50	15727.5	-21696.2	30.00	4.14	14	5

FIGURE 9.3.5-1 CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
151	12858.8	1352.6	30.00	10.99	14	5
152	14016.8	1363.3	29.98	11.02	14	7
153	15164.4	1199.8	29.98	11.09	14	7
154	16313.0	1004.8	29.95	11.17	14	5
155	17431.2	706.7	29.98	11.28	14	7
156	18529.3	336.8	29.98	11.41	14	7
157	19652.6	28.1	30.04	11.52	14	5
158	19843.8	0.0	30.04	11.53	14	0

THE PREVIOUS CONTOUR IS NUMBER 1 IN FILE NUMBER 2

PREVIOUS CONTOUR REQUIRED 150.00 SEC. TO COMPUTE

FIGURE 9.3.5-2 CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

analysis, then the angular orientation should remain at 0 degrees. This restriction is necessary because the angle command will rotate the plots but will not rotate the border of the coordinate system. Thus, the grid points and contour location are no longer coordinated. The next card identifies the number of runways. The entries are the keyword "RUNWAY" and the number of runways. This card is followed by all the runway definition cards as they appear in the contour analysis input file. (See Airport Section.) The next three cards contain keywords, "ALL," "REWIND," and "CATALOG," respectively, which control file manipulation. The last card to appear in the plot program input file must contain "END."

Figure 9.3.5.3 provide examples of NEF contours. The alphanumeric coordinate system correlates with that used in the Grid Analysis Output.

9.3.6 CONTOUR ANALYSIS MESSAGES

Fatal error messages indicate that the Contour Analysis Model will not execute until a correction is made. Notes are used to provide pertinent information. This section describes various messages associated with contour analysis, the severity, probable causes and possible correction action, if necessary.

1. <u>CANNOT FIND THE FIRST POINT</u>

   Severity: Fatal

   Cause: Program failed to find the point after many tries. This message is followed by several lines of output of details on each flight at 75 points.

CONTOUR PLOTTING PROCESS
(a separate input file for Plotting Program)

Columns	Description	Type
Card #1		
1-5	"TAPES"	A
11-20	FORTRAN logical unit number for contour input file (unit 2 in standard package)	0 < R
Card #2		
1-4	"PLOT"	A
11-20	FORTRAN logical unit number for plot output file (unit 8 in standard package)	0 < R
Card #3		
1-6	"PLTVAR"	A
11-20	plot area height in inches (standard = 11 inches)	0 < R
21-30	plot scale in ft./inch (standard = 8000 ft./inch)	0 < R
31-40	angular orientation of plot (standard = 0 degrees) (The plot border is always oriented to 0 degrees)	0 ≤ R ≤ 360
Card #4		
1-6	"RUNWAY"	A
11-20	number of runways	1 ≤ R ≤ 15

Insert Runway Definition Cards (see AIRPORT Section)

Columns	Description	Type
Card #5		
1-3	"ALL"	A
Card #6		
1-6	"REWIND"	A
Card #7		
1-6	"CATLOG"	A
Card #8		
1-3	"END"	A

Type: I - right justified integer; R - right justified integer or real number with a decimal point; A - alphanumeric

```
TAPES     2.0
PLOT      8.0
PLTVAR    11.0      8000.0    0.0
RUNWAY    4.0
  1 10000.0  0.0              0.0       0.0               27  9 T.O. RWY  27
  2 0.0      0.0              10000.0   0.0                9 27 T.O. RWY   9
  3 7000.0   -7000.0          2000.0    2000.0            31 13 T.O. RWY  31
  4 2000.0   2000.0           7000.0    -7000.0           13 31 T.O. RWY  13
ALL
REWIND
CATALOG
END
```

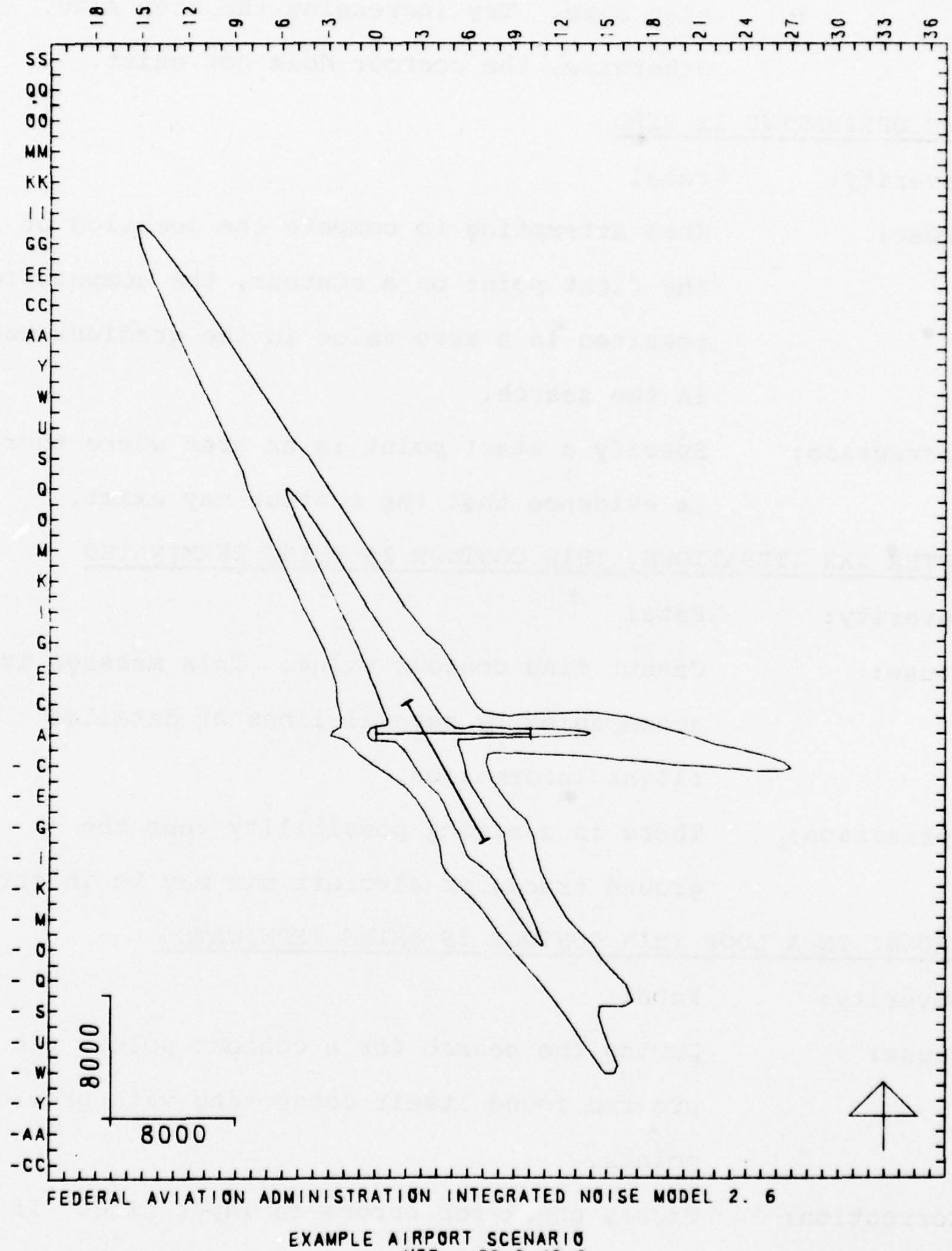


FIGURE 9.3.5-3 A SAMPLE NEF CONTOUR PLOT

Correction: If the metric sum columns give values of the noise measure in excess of the desired contour value then the problem lies in the step size. Try increasing the step size. Otherwise, the contour does not exist.

2. <u>THE DERIVATIVE IS ZERO</u>

Severity: Fatal

Cause: When attempting to compute the location of the first point on a contour, the computations resulted in a zero value in the gradient used in the search.

Correction: Specify a start point in an area where there is evidence that the contour may exist.

3. <u>AFTER XXX ITERATIONS, THIS CONTOUR IS BEING TERMINATED</u>

Severity: Fatal

Cause: Cannot find contour value. This message is accompanied by several lines of detailed flight information.

Correction: There is a strong possibility that the ground tracks or aircraft mix may be in error.

4. <u>CAUGHT IN A LOOP THIS CONTOUR IS BEING TERMINATED</u>

Severity: Fatal

Cause: During the search for a contour point, the program found itself connecting with previous points.

Correction: First, check for errors in input file. If there are none, then increase tolerance value and decrease step size.

5. MAXPTS EXCEEDED. THIS CONTOUR IS BEING TERMINATED

Severity: Fatal

Cause: The maximum points, either default or defined has been exceeded.

Correction: The absolute maximum number of points if 650. If that value is exceeded, then increase step size to produce entire contour. Another course of action would be to recover the terminated contour. Resubmit the job with another contour value card which specifies a start point that is identical to the last point printed and specifies a stop point which is identical to the first contour point. The total contour area is then the sum of the last area values on the two tabular outputs.

6. NOTE: THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S) APPROACH PARAMETER(S), TAKEOFF PROFILES(S), AND NONE CURVE(S)

Severity: None

Cause: The appearance of all or parts of this message indicates that non-standard aircraft performance and/or noise information was used on this run. This information should be reviewed as to its validity.

Correction: None

9.3.7 GRID ANALYSIS

The Grid Analysis Model can calculate the following measures of aircraft noise at specific locations around an airport:

(1) Time above six thresholds (65, 75, 85, 95, 105, and 115) of A-weighted Sound (TA)

(2) Equivalent Sound Level (Leq)

(3) Day-Night Average Sound Level (Ldn)

(4) Noise Exposure Forecast (NEF)

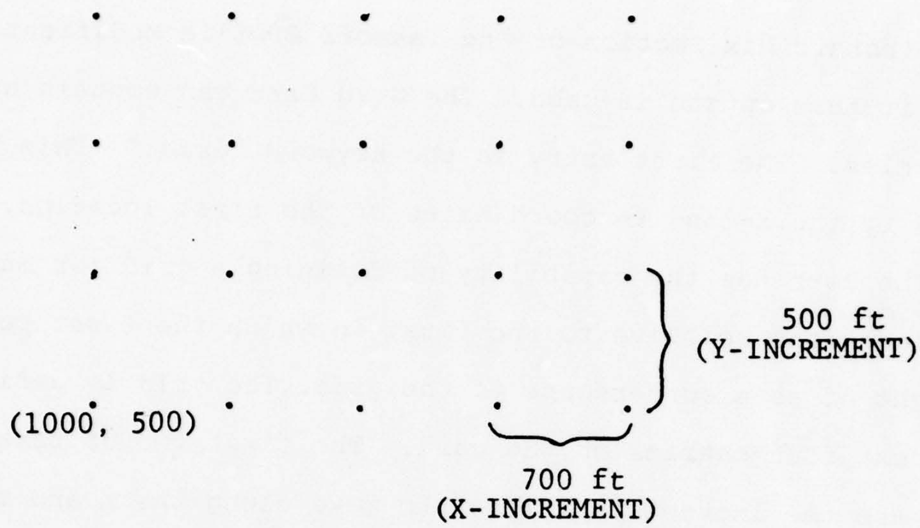
(5) Community Noise Equivalent Level (CNEL)

The grid analysis is designed to determine noise impact at noise sensitive locations without computing unnecessary information. The locations are chosen by pairs of coordinates in feet relative to the origin defined in the Airport Section. These locations are translated into alphanumeric coordinates on the output to relate grid analysis output with contour plots. The user has the option of calculating the total noise exposures at each location or requesting detailed information on each flight and the contributions of each of the aircraft as categorized by their noise curves. These options will be discussed in a later section.

9.3.8 GRID PROCESS CONTROL CARDS

The addition of one or more Grid Cards to the end of an input file will create a grid analysis input file. Two blank cards must separate the first Grid Card from the last valid input card

of the Aircraft Mix Section or the Takeoff Profile Modification Section if that option is used. The Grid Card can contain up to nine entries. The first entry is the keyword "Grid." This is followed by the X- and Y- coordinates of the first location, in feet. The user has the capability of defining a grid (or matrix) of the locations relative to the first in which the first point can be thought of as a cornerstone of the grid. The grid is defined by the next four entries on the card. The first two of these entries are the increments in feet to move along the X and Y axis, respectively. The signs (+ -) of the increments indicate the direction of movement. The next two entries specify the number of locations in the X- and Y- directions. The example multiple points grid card can be translated into the picture shown in Figure 9.3.8.1. The printout options field will be discussed in the next section on detailed grid analysis. Figure 9.3.8.2 is an example of a multiple points grid output. The location is identified by the "INTERSECTION" in which the first first value is the X- coordinate (in thousands of feet) and the second value is the letter representative of the Y- coordinate. This pair of coordinates defines a point within 1000 feet in both the X- and Y- direction of the actual location. The "OFFSET" column provides a closer approximation (within 1000 feet) of the actual location. The sign of the two values indicate whether the actual location is east or west and north or south, of the "INTERSECTION." If desired, the six thresholds of TA can be changed to any other set of six in the range of 65 to 115 dBA.



STARTING X-COORDINATE:	1000
STARTING Y-COORDINATE:	500
X-INCREMENT:	700
Y-INCREMENT:	500
NUMBER OF X VALUES:	5
NUMBER OF Y VALUES:	4

FIGURE 9.3.8-1 SCHEMATIC OF THE GRID

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO GRID ANALYSIS WITHOUT AIRCRAFT 101 07/30/79.

NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), AND TAKEOFF PROFILE(S).

INTER-SECTION	OFF SET	PERIOD	TIME IN MINUTES ABOVE INDICATED DBA LEVEL 65	75	85	95	105	115	LEQ	LDN	NEF	CNEL
0. B	.0..0	24 HOUR	74.8	31.0	12.0	2.7	.1	0.0	77.4	83.5	46.6	83.4
		EVENING	9.4	4.1	1.6	.2	0.0	0.0				
		NIGHT	17.1	6.8	2.7	1.0	.0	0.0				
1. B	.0..0	24 HOUR	61.2	37.5	16.7	3.7	.2	0.0	77.6	83.8	47.4	83.9
		EVENING	10.3	5.1	2.1	.2	0.0	0.0				
		NIGHT	16.7	8.1	3.9	1.1	.1	0.0				
0. C	.0..0	24 HOUR	60.7	34.1	9.8	1.7	0.0	0.0	72.3	77.7	42.2	77.9
		EVENING	7.8	4.6	.6	0.0	0.0	0.0				
		NIGHT	13.8	7.4	2.8	.7	0.0	0.0				
1. C	.0..0	24 HOUR	58.5	35.7	16.3	2.4	0.0	0.0	74.9	79.5	45.6	79.7
		EVENING	7.4	4.7	1.5	0.0	0.0	0.0				
		NIGHT	13.2	8.0	4.4	.7	0.0	0.0				
0. D	.0..0	24 HOUR	59.5	32.0	9.2	.3	0.0	0.0	71.0	75.2	41.7	75.4
		EVENING	7.6	3.8	.2	0.0	0.0	0.0				
		NIGHT	13.7	7.2	2.9	0.0	0.0	0.0				
1. D	.0..0	24 HOUR	56.0	30.4	11.6	2.2	0.0	0.0	75.2	79.0	47.8	79.2
		EVENING	7.1	3.5	.4	.1	0.0	0.0				
		NIGHT	12.8	7.0	3.6	.4	0.0	0.0				
0. E	.0..0	24 HOUR	55.7	27.1	9.8	.3	0.0	0.0	71.3	74.9	43.1	75.0
		EVENING	6.7	2.4	.3	.0	0.0	0.0				
		NIGHT	13.1	6.8	2.8	.0	0.0	0.0				
1. E	.0..0	24 HOUR	51.8	26.1	10.6	2.0	.4	0.0	77.5	81.7	51.4	82.0
		EVENING	6.2	2.3	.4	.1	.0	0.0				
		NIGHT	12.0	6.7	3.1	.4	.1	0.0				
0. F	.0..0	24 HOUR	49.4	24.5	8.5	1.4	0.0	0.0	73.6	77.6	47.3	77.8
		EVENING	5.4	1.8	.3	.1	0.0	0.0				
		NIGHT	12.0	6.5	2.2	.3	0.0	0.0				
1. F	.0..0	24 HOUR	51.5	23.4	8.8	.9	0.0	0.0	71.5	74.9	44.1	75.1
		EVENING	5.8	1.5	.3	.1	0.0	0.0				
		NIGHT	12.4	6.3	2.3	.2	0.0	0.0				

X-START	Y-START	X-STEP	Y-STEP	NX	NY	OPTIONS
0.00	1000.00	1000.	1000.	2	5	00000

FIGURE 9.[illegible]-2 STANDARD GRID ANALYSIS OUTPUT

To change the TA thresholds, the user must insert two cards before the grid card(s). The first card contains the keyword "THRSH" beginning in the first column. The second card contains the six A-weighted thresholds. The entries must be monotonically increasing and must fall within the range of 65 to 115 dBA. The TA thresholds can be changed several times during a single execution.

9.3.9 DETAILED GRID ANALYSIS

The printout option field of the grid card allows the user to print the contribution of each noise curve to the noise exposures (option 3) and/or to print the details of each flight (option 4) at one or more locations. For the detailed printouts, '3' and/or '4' are entered in the rightmost columns of the printout options field. If the options are specified on a multiple points grid card then the detailed output will accompany each point.

Figure 9.3.9.1 shows an example of an option 3 output for a single location . Figure 9.3.9.2 shows an example of an option 4 output for the same point. These two printouts were produced by one grid card. In Figure 9.3.9.2 details on a flight are contained on two lines. The first line provides positional and performance information. The second line presents the contributions of that flight to the noise exposures. The first line contains, in order, the flight number (FLT), unused variable (G), track identification number (TR), profile identification number (PRF), noise curve identification number (NC), an internal variable (MAXSEG), the distance between the track and the location of the grid point (D TO TRK), the distance from the grid point to the start of the track (D ALONG TRK), the correction to noise level for extra ground attenuation and velocity (GRND ATTN),

the aircraft altitude at the point on the track nearest the grid point (ALTITUDE), the thrust per engine at that point (THRUST) and the aircraft velocity in knots at that point (VELOCITY). The second line is broken down into ten pairs of data. The elements of each pair are connected by commas. The first member of the pair is the contribution of the flight to the particular noise metric. The second member is the running total of the noise metric up to and including that flight. The pairs of data are presented in the following order, NEF, Ldn, CNEL, Leq, and TA values at each of the six A-weighted thresholds.

The detailed outputs enable the user to check the logic of the computations if a question does arise.

9.3.10 GRID ANALYSIS MESSAGES

In Grid Analysis Model, a fatal message indicates that the model will terminate execution until a correction is made. A warning message indicates that the user should be wary as to the implication of the results. Notes are designed to convey information. This section describes various messages associated with grid analysis, their severity, probable causes and corrective actions, if necessary.

1. <u>*NO TIME ABOVE VALUES CALCULATED (DIRECTIVITY DATA NOT AVAILABLE FOR NEW AIRCRAFT TYPES)*</u>

   Severity: Warning

   Cause: Whenever the model discovers non-standard noise curve are used then the TA output is suppressed. This is necessary because the complexity of the TA algorithm is beyond

CONTRIBUTION OF AIRCRAFT WITH ASSIGNED NOISE CURVES AT POINT X= 0.00, 1000.00

METRIC	NOISE CURVE ASSIGNMENTS																			
	2	8	11	19	20	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEF	27.6	32.8	35.1	45.9	26.3	21.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LDN	64.8	71.3	63.6	83.0	63.7	54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CNEL	65.3	73.5	63.8	83.0	63.7	54.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEQ	60.2	71.3	58.0	75.7	63.7	49.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T(X1) 24H	11.	7.	16.	18.	8.	15.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X1) E	2.	2.	1.	2.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X1) N	2.	0.	5.	6.	0.	4.	0.	0.	.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) 24H	6.	4.	7.	11.	3.	0.	0.	0.	.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) E	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) N	1.	0.	2.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) 24H	0.	3.	1.	7.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) E	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) N	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) 24H	0.	1.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) N	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) 24H	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) 24H	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FIGURE 9.3.9-1 DETAILED GRID ANALYSIS OUTPUT OPTION #3

```
                     FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
               EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101                07/30/79.

POINT, X=.0              Y=.10000000E+04
FLT  G  TR PRF NC MAXSEG  D TO TRK      D ALONG T.C  (2ND.)         GRND ATTN ALTITUDE     THRUST      VELOCITY
  1  0  9 301  2   1  0  .7064832E+040.              0.              -.6010E+010.              .800000E+04 .32000E+02
 3.73, 3.73  45.00,45.00  45.61,45.61  40.06,40.06   0.0,  0.00   0.0,  0.00    0.0,  0.00    0.0,  0.00    0.0,   0.00    0.0,  0.00
  2  0  8  49  2   1  0  .2236068E+040.              0.              -.4720E+010.              .122000E+05 .32000E+02
25.81,25.83  62.76,62.64  63.04,63.11  57.14,57.23   5.4,  5.44   2.8,  2.82    0.0,  0.00    0.0,  0.00    0.0,   0.00    0.0,  0.00
  3  0  7  49  2   1  0  .2236068E+040.              0.              -.4720E+010.              .122000E+05 .32000E+02
14.46,26.14  53.29,63.29  55.98,63.88  53.29,58.70   2.2,  7.68   1.2,  3.98    0.0,  0.00    0.0,  0.00    0.0,   0.00    0.0,  0.00
  4  0  7  48  2   1  0  .2236068E+040.              0.              -.4720E+010.              .122000E+05 .32000E+02
22.18,27.60  59.31,64.75  59  9,65.34  54.84,60.20   3.1, 10.82   1.6,  5.57    0.0,  0.00    0.0,  0.00    0.0,   0.00    0.0,  0.00
  5  0  6 302  8   1  0  .6     45E+040.             0.              -.6010E+010.              .800000E+04 .32000E+02
 9.36,27.67  42.22,64.78  43.  ,65.37  37.45,60.22   0.0, 10.82   0.0,  5.57    0.0,  0.00    0.0,  0.00    0.0,   0.00    0.0,  0.00
  6  0  6  20  8   1  0  .1000000E+040.              0.              -.2010E+010.              .123000E+05 .32000E+02
28.71,31.23  66.66,68.83  68.87,70.48  66.66,67.55   4.0, 14.84   2.8,  8.38    1.8,  1.85    0.0,  0.00    0.0,   0.00    0.0,  0.00
  7  0  6  18  8   1  0  .1000000E+040.              0.              -.2010E+010.              .150000E+05 .32000E+02
30.60,33.94  69.46,72.17  71.68,74.13  69.46,71.62   2.7, 17.50   1.5,  9.92    1.1,  2.91     .5,   .53    0.0,   0.00    0.0,  0.00
  8  0  4  91 26   1  0  .1000000E+040.              0.              -.2010E+010.              .121350E+04 .32000E+02
20.63,34.14  53.93,72.23  54.25,74.17  48.81,71.64   8.4, 25.92   0.0,  9.92    0.0,  2.91    0.0,   .53    0.0,   0.00    0.0,  0.00
  9  0  3 301 20   1  0  .2233957E+04 .1039276E+050.                 -.1037E+02 .576386E+02 .440925E+04 .14600E+03
 -.83,34.14  36.85,72.23  36.85,74.17  36.85,71.64   2.5, 28.39   0.0,  9.92    0.0,  2.91    0.0,   .53    0.0,   0.00    0.0,  0.00
 10  0  3 301 11   1  0  .2233957E+04 .1039276E+050.                 -.1003E+02 .576386E+02 .389316E+04 .13500E+03
17.35,34.23  47.75,72.25  48.02,74.19  42.13,71.65   3.4, 31.82   0.0,  9.92    0.0,  2.91    0.0,   .53    0.0,   0.00    0.0,  0.00
 11  0  3  41 11   1  0  .2233957E+04 .1039276E+050.                 -.1871E+01 .492555E+03 .138100E+05 .17000E+03
14.95,34.28  45.34,72.26  45.34,74.19  45.34,71.66    .7, 32.54    .5, 10.38     .1,  2.97    0.0,   .53    0.0,   0.00    0.0,  0.00
 12  0  3  40 11   1  0  .2233957E+04 .1039276E+050.                 -.1470E+01 .747911E+03 .139000E+05 .16600E+03
28.04,35.20  56.64,72.37  56.64,74.27  51.52,71.70   2.7, 35.22   1.9, 12.27     .3,  3.23    0.0,   .53    0.0,   0.00    0.0,  0.00
 13  0  3  39 20   1  0  .2233957E+04 .1039276E+050.                 -.1252E+01 .894499E+03 .140000E+05 .16300E+03
19.51,35.32  56.91,72.50  56.91,74.35  56.91,71.84   1.3, 36.56    .7, 13.01     .4,  3.58    0.0,   .53    0.0,   0.00    0.0,  0.00
 14  0  3  39 11   1  0  .2233957E+04 .1039276E+050.                 -.1252E+01 .894499E+03 .140000E+05 .16300E+03
27.88,36.04  54.37,72.60  56.37,74.41  50.35,71.87   2.1, 38.70   1.3, 14.29     .2,  3.78    0.0,   .53    0.0,   0.00    0.0,  0.00
 15  0  3  38 20   1  0  .2233957E+04 .1039276E+050.                 -.8617E+00 .110890E+04 .141000E+05 .15500E+03
22.68,36.24  60.08,72.84  60.08,74.57  60.08,72.15   2.4, 41.14   1.7, 15.94     .7,  4.50    0.0,   .53    0.0,   0.00    0.0,  0.00
 16  0  3  38 11   1  0  .2233957E+04 .1039276E+050.                 -.8617E+00 .110890E+04 .141000E+05 .15500E+03
32.72,37.83  61.23,73.13  61.46,74.78  55.21,72.24   7.2, 48.32   3.4, 19.37     .6,  5.07    0.0,   .53    0.0,   0.00    0.0,  0.00
 17  0  3  28 20   1  0  .2233957E+04 .1039276E+050.                 -.1005E+01 .894499E+03 .152000E+05 .15400E+03
21.79,37.94  59.19,73.30  59.19,74.90  59.19,72.45   1.5, 49.87    .9, 20.23     .4,  5.51     .1,   .66    0.0,   0.00    0.0,  0.00
 18  0  2 303 26   1  0  .1000000E+04 .1000000E+050.                 -.4060E+01 .525478E+02 .486320E+03 .80000E+02
11.88,37.95  45.18,73.31  45.50,74.90  40.06,72.45   6.5, 56.39   0.0, 20.23    0.0,  5.51    0.0,   .66    0.0,   0.00    0.0,  0.00
 19  0  1 301 19   1  0  .1000000E+04 .1000000E+050.                 -.6790E+01 .525478E+02 .100192E+05 .15000E+03
26.88,38.28  64.93,73.90  65.85,75.41  61.66,72.80   7.6, 63.99   4.6, 24.87    2.4,  7.86    0.0,   .66    0.0,   0.00    0.0,  0.00
 20  0  1  31 19   1  0  .1000000E+04 .1000000E+050.                 -.1189E+01 .433333E+03 .152000E+05 .16300E+03
43.07,44.32  80.16,81.08  80.16,81.41  72.75,75.79   5.3, 69.24   3.1, 28.00    2.0,  9.88    1.0,  1.66     .1,    .09    0.0,  0.00
 21  0  1  29 19   1  0  .1000000E+04 .1000000E+050.                 -.7178E+00 .660897E+03 .152000E+05 .15800E+03
42.67,46.58  79.70,83.45  79.70,83.65  72.29,77.39   5.6, 74.81   3.0, 31.02    2.2, 12.03    1.1,  2.71    0.0,    .09    0.0,  0.00
```

FIGURE 9.3.9-2 GRID ANAL' 'S OUTPUT, OPTION #4

GRID ANALYSIS CONTROL

(Append to end of the input file. Two blank cards must separate these cards from last valid input card.)

Column	Description	Type
THRSH Card (optional)		
1-5	"THRSH"	A
Thresholds Card (accompanies THRSH Card)		
1-10 11-20 21-30 31-40 41-50 51-60	six alternative TA thresholds (dBA) (default: 65,75,85,95,105 and 115)	$65 \leq R \leq 115$
Grid Card(s)		
1- 5	"GRID"	A
6-15	DO NOT USE	
16-25	starting X coordinate in ft.	R
26-35	starting Y coordinate in ft.	R
36-45	X increment in ft.	R
46-55	Y increment in ft.	R
56-60	number of X values	$0 < I$
61-65	number of Y values	$0 < I$
66-70	detailed print options: 3 - tabulation by noise curve number 4 - details on each flight (neither, either or both)	I
End Card		
1-3	"END"	A

Type:
- I - right justified integer
- R - right justified integer or real number with a decimal point
- A - alphanumeric

```
TARSH
65.0      75.0      80.0      90.0      100.0     110.0
GRID           500.0     300.0     1000.0    1000.0        5    4   34
END
```

the ability of a typical user to add non-standard TA parameters. (This problem is discussed in the second issue of "INM Bulletin," May 1979.)

Correction: None

2. ERROR IN TIHISI: INDICATOR = XXX

Severity: Fatal

Cause: The program is not operating properly for a TA calculation.

Correction: The only viable alternative at this time is to skip the grid point at which the error occurs.

3. NOTE: THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILES(S), AND NOISE CURVE(S)

Severity: None

Cause: The appearance of all or parts of this message indicates that non-standard aircraft noise and/or performance information was used on this run. The information should be reviewed as to its validity. The appearance of noise curves in this message will trigger message #1 and the ensuing action by the model.

Correction: None

9.4 VERIFY

The probability of producing unacceptable INM output because of erroneous input data is high. The complexity of the input requirements is the major cause of problems. Clear, complete documentation is one step to eliminating or lessening the execution errors. A second step is self-explanatory diagnostic messages which accompany terminated executions of the INM. A third step is a method of scanning an INM input file for both form and content.

Version 2 contains the option of foregoing the execution of an input file and, rather, verifying the position and feasibility of each of the input elements. This option is most efficient and cost effective prior to the execution of the initial input file of a series of cases or planning alternatives. To activate the verify option, the user simply replaces the first card in the input file, the title card, with a card that contains "VERIFY" in the first six columns with the remainder of the card blank. The user then follows the standard procedure for INM execution. The user must remember that upon activating the verify option, INM cannot proceed with the normal execution. After all the indicated corrections have been made, the user can produce INM output from the input file by replacing the verify card with the title card as the first card in the input file and again following the standard procedure for INM execution.

The diagnostic messages of the verify output are self-explanatory. Some of the messages are for information, some are warnings to possibly illogical data and the remainder

indicate areas which would prove fatal to the normal execution of that file. An erroneous or offending entry is underlined by the character set "A...A."

The one area in which the verify option cannot operate properly is dealing with missing or incorrectly positioned input control cards. (See Section 9.2.) When the message "*FATAL: ILLEGAL CONTROL CARD, SCAN ABORTS, ATTEMPTING RECOVERY*" appears, the cause can be laid upon incorrect control cards. In most cases, the recovery will be unsuccessful and input sections will go unchecked. It is, therefore, important that the user follows implicitly the instructions on input control cards.

APPENDIX A

The previous sections of this guide have presented all the information required to use the INM for predicting noise exposure levels around airports. This section will present five examples of INM usage. Each input case will be followed by the complete output listing generated by the INM.

```
 EXAMPLE AIRPORT SCENARIO
NEF
100    1             AIRPORT SECTION
         0.      15.0
  1   10000.        0.                    0.         0.             27  9 T.O. RWY 27
  2       0.        0.                10000.         0.              9 27 T.O. RWY  9
  3    7000.    -7000.                 2000.      2000.             31 13 T.O. RWY 31
  4    2000.     2000.                 7000.     -7000.             13 31 T.O. RWY 13

 1 1 1  50.
 1 2 3   .5  45.  1.5  50.
 3 3 1  50.
 2 4 5   .5  90. -1.5  1.5   0.  45. -1.5  50.
 2 5 1  50.
 2 6 3   .5  10.  1.5  50.
 4 7 3   .5  30. -1.5  50.
 4 8 3  1.0  30. -1.5  50.
 4 9 1  50.

107               AIRCRAFT SELECTION SECTION
 3, 5, 8,43

101               PROFILE SECTION
301             STANDARD 3 DEGREE APPROACH
     -1.0    -.165    2.975    9.255  12.395  18.675
      0.0      0.0    1000.    3000.   4000.   5000.
      32.      -2.      -2.      -2.     -2.     -2.
     -10.      -3.      -6.      -6.     -6.
302             STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
     -1.0    -.165    2.975    9.255     12.   15.14
      0.0      0.0    1000.    3000.   3000.   4000.
      32.      -2.      -2.      -2.     -2.     -2.
     -10.      -3.      -6.      -5.     -6.
303             GA. 3 DEGREE APPROACH
     -1.0    -.165    2.975    9.255  12.395  18.675
      0.0      0.0    1000.    3000.   4000.   5000.
      32.      -2.      -2.      -2.     -2.     -2.
      -3.      -3.      -3.      -3.     -3.

100    3             AIRCRAFT MIX SECTION
  3 7                3. 1. 1. 2.1.5
  3 8                                      3. 1. 1. 2.    1.5
  3 9301 9. 4. 4.
  5 6302 4. 3. 2. 2. 1.     2. 1.     2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.    1. 3.    1. 1.
 43 4               25. 5.10.
 43 230325. 5.10.

CONTOUR
30.
-40.
END
```

FIGURE A-1. INPUT CASE #1 - NEF CONTOURS

```
FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO                                                                        08/06/79.
NEF
PRIMARY  1=NEF    FACTORS 88.0  1.0 16.7
ALTERNATES  *NONE*
-----------------------------------------------------------------------
I     I         I         I          I CONTOUR I        I               I
I PNT I    X    I    Y    I   NEF    I  AREA   I FLTS I ITERATIONS I
I     I  COORD. I  COORD. IDECIBELS  I SQ. MI. I USED I               I
-----------------------------------------------------------------------

1000  1  0.000       AIRPORT SECTION


                 AIRPORT ALTITUDE=      0. FT ABOVE MSL          AMBIENT TEMP= 15.DEG C

RUNWAY  1   10000.00        0.00        0.00       0.00        0.00        0.00   27  9 T.O. RWY 27          LENGTH = 10000.
RUNWAY  2       0.00        0.00        0.00   10000.00        0.00        0.00    9 27 T.O. RWY  9          LENGTH = 10000.
RUNWAY  3    7000.00    -7000.00        0.00    2000.00     2000.00        0.00   31 13 T.O. RWY 31          LENGTH = 10296.
RUNWAY  4    2000.00     2000.00        0.00    7000.00    -7000.00        0.00   13 31 T.O. RWY 13          LENGTH = 10296.
TRACK DATA  1 1 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  1 2 3    .50  45.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  3 3 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 4 5    .50  90.00  -1.50   1.50   0.00  45.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 5 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 6 3    .50  10.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 7 3    .50  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 8 3   1.00  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 9 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00

1070  0  0.000      AIRCRAFT SELECTION SECTION

THE FOLLOWING AIRCRAFT ARE RETRIEVED AS THEY APPEAR IN THE DATA BASE:
   3  5  8 43

1010  0  0.000      PROFILE SECTION

PROFILE 301 (N.M.)             STANDARD 3 DEGREE APPROACH
     -1.00      -.17      2.98      9.26     12.40     18.68      0.00      0.00      0.00      0.00
      0.00      0.00   1000.00   3000.00   4000.00   5000.00      0.00      0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
    -10.00     -3.00     -6.00     -6.00     -6.00      0.00      0.00      0.00      0.00      0.00
PROFILE 302 (N.M.)             STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
     -1.00      -.17      2.98      9.26     12.00     15.14      0.00      0.00      0.00      0.00
      0.00      0.00   1000.00   3000.00   3000.00   4000.00      0.00      0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
    -10.00     -3.00     -6.00     -5.00     -6.00      0.00      0.00      0.00      0.00      0.00
PROFILE 303 (N.M.)             GA. 3 DEGREE APPROACH
     -1.00      -.17      2.98      9.26     12.40     18.68      0.00      0.00      0.00      0.00
      0.00      0.00   1000.00   3000.00   4000.00   5000.00      0.00      0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
     -3.00     -3.00     -3.00     -3.00     -3.00      0.00      0.00      0.00      0.00      0.00

1000  3  0.000       AIRCRAFT MIX SECTION
```

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1

MIX DATA

1	7	0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	9	301	9.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	6	302	4.0	3.0	2.0	2.0	1.0	0.0	2.0	1.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	3	301	10.0	2.0	5.0	5.0	1.0	3.0	2.0	0.0	1.0	3.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	4	0	0.0	0.0	0.0	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	2	303	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FEDERAL AVIATION ADMINISTRATION INTEGRATFD NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

08/06/79.

A/C	A/C NAME		NC		ARRIVALS		0- 500		500-1000		1000-1500		1500-2500		2500-3500		3500-4500		4500- UP
3		BAC-111	2	D	9.0	48	3.0	49	2.0	49	3.0	49	2.0	0	0.0	0	0.0	0	0.0
				E	4.0		1.0		1.5		1.0		0.0		0.0		0.0		0.0
				N	4.0		1.0		0.0		1.0		1.5		0.0		0.0		0.0
5	3E NBTF	727-200	8	D	4.0	18	2.0	20	2.0	20	2.0	20	0.0	0	0.0	0	0.0	0	0.0
				E	3.0		1.0		1.0		1.0		0.0		0.0		0.0		0.0
				N	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
8		707-120R	11	D	10.0	38	5.0	39	2.0	40	3.0	41	1.0	42	0.0	42	0.0	42	0.0
				E	2.0		1.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	5.0		3.0		1.0		1.0		0.0		0.0		0.0		0.0
43	MSEP6	GA	26	D	25.0	91	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
				E	5.0		5.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	10.0		10.0		0.0		0.0		0.0		0.0		0.0		0.0

FEDERAL AVIATION ADMINISTRATION INTEGRATFD NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

RUNWAY UTILIZATION

RUNWAYS-		27	9	31	13	TOT
TAKEOFFS (ACTUAL)	D	0.0	31.0	11.0	10.0	52.0
	E	0.0	8.0	1.0	3.5	12.5
	N	0.0	10.0	5.0	3.5	18.5
TAKEOFFS (PERCENT)	D	0.0	37.3	13.3	12.0	
	E	0.0	9.6	1.2	4.2	
	N	0.0	12.0	6.0	4.2	
LANDINGS (ACTUAL)	D	4.0	25.0	9.0	10.0	48.0
	E	3.0	5.0	4.0	2.0	14.0
	N	2.0	10.0	4.0	5.0	21.0
LANDINGS (PERCENT)	D	4.8	30.1	10.8	12.0	
	E	3.6	6.0	4.8	2.4	
	N	2.4	12.0	4.8	6.0	

TOTAL TAKEOFFS 83.0 LANDINGS 83.0

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

```
TOTAL OPERATIONS - DAILY   166.  - YEARLY   60590.
DEFAULT RUNWAY  2    9

 TOTAL FLIGHTS    14

  00  0  0.000


 CONTOUR

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO                                                                    08/06/79.

CONTOUR VALUE  30.00
TOLERANCE  .100
START POINT        0.00        0.00   AUTO-START
STEP SIZE      1165.00
STOP POINT        0.00        0.00
MAX. POINTS    250
ERROR CODE       0
```

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
1	19843.8	0.0	29.95	0.00	14	14
2	20938.2	-373.9	29.99	.13	14	7
3	22035.6	-735.0	30.01	.26	14	7
4	23169.1	-1004.0	29.99	.35	14	5
5	24301.0	-1280.0	29.96	.45	14	5
6	25429.6	-1569.0	29.92	.55	14	5
7	26522.6	-1950.1	30.06	.69	14	7
8	26902.2	-2391.9	30.05	.89	14	10
9	26327.8	-2488.5	30.10	.96	14	11
10	25162.8	-2477.0	29.94	1.00	14	5
11	24007.9	-2354.0	30.01	1.00	14	7
12	22848.6	-2239.2	29.98	1.00	14	5
13	21690.9	-2109.1	29.95	.99	14	5
14	20535.5	-2078.8	29.97	1.03	14	7
15	19382.2	-2014.7	29.97	1.04	14	7
16	18225.1	-1878.8	29.96	1.04	14	5
17	17068.9	-1768.2	29.99	1.05	14	7
18	15915.9	-1689.0	29.98	1.06	14	7
19	14759.9	-1544.4	29.97	1.05	14	5
20	13604.2	-1438.7	30.00	1.05	14	7
21	12440.3	-1388.1	30.01	1.07	14	5
22	11276.2	-1343.9	30.01	1.09	14	5
23	10111.7	-1308.5	30.10	1.11	14	5
24	8956.7	-1233.5	29.94	1.12	14	7
25	7803.4	-1298.2	29.94	1.16	14	7
26	7272.7	-1504.6	29.98	1.20	14	10
27	7163.6	-2076.8	30.06	1.28	14	10
28	7636.9	-3141.3	29.90	1.40	14	7
29	8270.4	-4108.3	29.97	1.49	14	7
30	9009.9	-4996.5	29.98	1.57	14	7
31	9877.5	-5774.0	29.95	1.62	14	5
32	10253.9	-6866.7	29.99	1.77	14	7
33	10467.7	-8007.2	29.99	1.96	14	7
34	10801.9	-9113.5	29.98	2.12	14	7
35	11298.9	-10160.8	29.99	2.24	14	7
36	11894.5	-11156.4	30.00	2.33	14	7
37	12502.2	-12139.1	29.99	2.42	14	7
38	13282.4	-12998.5	30.00	2.44	14	7
39	14092.7	-13835.5	29.99	2.45	14	5
40	14720.9	-14816.6	30.09	2.55	14	5
41	15543.0	-15632.2	30.00	2.54	14	7
42	16332.8	-16488.6	29.95	2.56	14	5
43	16796.1	-17557.6	30.00	2.74	14	7
44	16235.1	-17714.5	30.09	2.96	14	11
45	15080.0	-17724.8	30.01	3.33	14	7
46	14537.0	-17872.4	29.99	3.54	14	9
47	14492.9	-18439.6	29.96	3.70	14	11
48	14848.7	-19538.5	29.95	3.87	14	7
49	15273.7	-20623.2	30.06	4.01	14	5
50	15727.5	-21696.2	30.00	4.14	14	5

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
51	15456.8	-22199.4	30.02	4.39	14	10
52	14889.9	-22142.5	30.07	4.60	14	12
53	14220.1	-21189.3	29.98	4.61	14	5
54	13571.8	-20221.3	29.94	4.61	14	5
55	12932.0	-19247.7	29.93	4.60	14	5
56	12292.7	-18273.8	30.00	4.60	14	5
57	11588.3	-17350.8	29.98	4.62	14	7
58	10873.6	-16434.5	29.99	4.66	14	7
59	10136.2	-15532.6	30.09	4.70	14	5
60	9344.0	-14685.7	29.99	4.76	14	7
61	8613.3	-13786.3	29.99	4.81	14	7
62	7930.8	-12845.8	30.00	4.83	14	7
63	7251.7	-11899.2	29.99	4.85	14	5
64	6531.6	-10989.6	29.99	4.89	14	7
65	5705.0	-10180.6	29.99	4.95	14	7
66	4876.1	-9369.2	29.99	5.02	14	7
67	4319.1	-8352.0	29.99	5.03	14	7
68	4150.6	-7208.7	29.98	4.96	14	7
69	3745.5	-6120.9	29.99	4.94	14	7
70	3223.9	-5090.3	29.97	4.92	14	7
71	2560.8	-4139.8	29.98	4.93	14	7
72	1776.2	-3278.7	30.02	4.95	14	5
73	843.5	-2597.2	30.00	4.98	14	7
74	-137.5	-1976.9	30.00	5.02	14	7
75	-1064.1	-1283.2	29.98	5.05	14	7
76	-1873.1	-453.6	29.98	5.09	14	7
77	-2382.7	-214.7	29.98	5.10	14	10
78	-2944.0	-59.0	30.08	5.11	14	7
79	-2750.3	148.5	29.99	5.12	14	13
80	-2256.5	419.0	29.93	5.13	14	10
81	-2166.0	981.8	30.00	5.16	14	10
82	-2433.2	2105.6	29.99	5.20	14	7
83	-2504.7	3258.5	29.99	5.24	14	7
84	-2877.1	4353.8	29.99	5.27	14	7
85	-3272.5	5445.4	29.99	5.30	14	7
86	-3771.9	6487.1	29.99	5.31	14	7
87	-4307.7	7521.6	29.95	5.32	14	5
88	-4814.1	8570.8	29.91	5.33	14	5
89	-5308.6	9625.6	29.91	5.34	14	5
90	-5802.0	10681.0	29.91	5.36	14	5
91	-6294.5	11736.8	29.92	5.37	14	5
92	-6794.5	12789.0	29.93	5.39	14	5
93	-7295.1	13841.0	29.93	5.40	14	5
94	-7798.6	14891.6	29.93	5.41	14	5
95	-8261.3	15955.4	29.99	5.44	14	7
96	-8564.2	17073.2	29.99	5.52	14	7
97	-9063.2	18125.9	29.99	5.53	14	5
98	-9562.7	19178.4	29.99	5.54	14	5
99	-10062.4	20230.8	29.99	5.54	14	5
100	-10561.8	21283.3	29.99	5.55	14	5

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
101	-11059.9	22336.5	29.99	5.56	14	5
102	-11555.8	23390.7	29.98	5.57	14	5
103	-12049.0	24446.1	29.97	5.58	14	5
104	-12535.6	25504.6	29.96	5.60	14	5
105	-13017.3	26565.4	29.95	5.62	14	5
106	-13492.6	27629.0	29.94	5.64	14	5
107	-13959.3	28696.4	29.92	5.67	14	5
108	-14413.9	29769.1	29.90	5.70	14	5
109	-14778.9	30867.7	30.02	5.79	14	7
110	-15172.8	31964.0	29.96	5.86	14	5
111	-15392.5	33108.1	29.91	6.05	14	9
112	-15105.7	33158.6	29.91	6.23	14	11
113	-14280.2	32336.5	29.94	6.50	14	7
114	-13581.5	31414.0	30.02	6.67	14	7
115	-12863.2	30496.8	29.97	6.85	14	5
116	-12176.6	29555.6	29.95	7.01	14	5
117	-11507.0	28602.3	29.93	7.16	14	5
118	-10848.7	27641.1	29.91	7.30	14	5
119	-10198.1	26674.7	29.90	7.43	14	5
120	-9584.5	25689.1	30.01	7.54	14	7
121	-8943.1	24716.6	29.99	7.67	14	5
122	-8307.9	23740.0	29.99	7.80	14	5
123	-7675.2	22761.8	29.98	7.92	14	5
124	-7044.4	21782.3	29.98	8.04	14	5
125	-6414.3	20802.5	29.98	8.17	14	5
126	-5784.5	19822.3	29.98	8.29	14	5
127	-5155.0	18842.1	29.98	8.41	14	5
128	-4351.3	18009.1	30.00	8.60	14	7
129	-3743.4	17015.2	30.06	8.72	14	7
130	-3118.8	16031.8	30.07	8.85	14	5
131	-2493.2	15049.1	30.07	8.97	14	5
132	-1865.0	14067.9	30.07	9.10	14	5
133	-1236.3	13087.1	30.09	9.22	14	5
134	-600.8	12110.8	30.09	9.35	14	5
135	33.9	11133.8	30.08	9.48	14	5
136	664.5	10154.3	30.09	9.61	14	5
137	1284.3	9167.8	30.00	9.73	14	5
138	1917.6	8196.9	29.99	9.86	14	7
139	2624.0	7275.3	30.00	9.99	14	7
140	3333.1	6356.4	30.00	10.13	14	7
141	4241.5	5641.7	29.99	10.27	14	7
142	4879.4	4666.9	29.98	10.41	14	5
143	5463.4	3664.5	30.00	10.55	14	7
144	6014.4	2643.0	30.00	10.69	14	7
145	6634.8	1663.5	29.99	10.82	14	7
146	7073.2	1283.4	30.00	10.88	14	12
147	8228.2	1131.4	30.03	10.93	14	7
148	9375.9	1263.3	30.02	10.93	14	7
149	10530.2	1314.5	29.95	10.95	14	7
150	11694.8	1343.7	30.01	10.97	14	5

FIGURE A-2. CONTOUR ANALYSIS REPORT
FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
151	12858.8	1392.6	30.00	10.99	14	5
152	14016.8	1363.3	29.98	11.02	14	7
153	15164.4	1199.8	29.98	11.09	14	7
154	16313.0	1004.8	29.95	11.17	14	5
155	17431.2	706.7	29.98	11.28	14	7
156	18529.3	336.8	29.98	11.41	14	7
157	19652.6	28.1	30.04	11.52	14	5
158	19843.8	0.0	30.04	11.53	14	0

THE PREVIOUS CONTOUR IS NUMBER 1 IN FILE NUMBER 2

PREVIOUS CONTOUR REQUIRED 150.00 SEC. TO COMPUTE

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
CONTOUR VALUE -40.00
TOLERANCE .100
START POINT 0.00 0.00 AUTO-START
STEP SIZE 732.00
STOP POINT 0.00 0.00
MAX. POINTS 250
ERROR CODE 0

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
1	13906.3	0.0	40.02	0.00	14	12
2	13761.8	-112.4	39.94	.03	14	13
3	13033.0	-153.6	40.00	.04	14	8
4	12303.7	-197.4	40.02	.05	14	7
5	11572.7	-235.1	39.95	.06	14	5
6	10841.2	-264.4	39.91	.07	14	5
7	10110.1	-284.1	39.95	.08	14	7
8	9381.5	-272.4	39.92	.08	14	8
9	8653.3	-276.9	39.99	.09	14	8
10	7924.3	-327.5	39.98	.10	14	7
11	7195.2	-329.4	39.95	.10	14	8
12	6473.3	-408.6	39.96	.12	14	7
13	6112.1	-448.2	39.96	.12	14	10
14	5760.0	-358.3	39.99	.12	14	10
15	5402.3	-392.8	39.94	.12	14	10
16	5340.3	-747.4	39.99	.16	14	11
17	5598.2	-1425.8	40.00	.22	14	7
18	5796.3	-2124.6	39.96	.28	14	7
19	5926.1	-2845.0	40.02	.35	14	5
20	6249.3	-3497.1	39.97	.41	14	7
21	6652.6	-4102.6	39.97	.45	14	7
22	7046.1	-4716.2	39.98	.49	14	7
23	7420.0	-5342.4	39.98	.54	14	7
24	7856.7	-5923.7	39.97	.58	14	7
25	8309.6	-6495.8	39.99	.61	14	7
26	8445.8	-7210.5	39.98	.70	14	7
27	8462.7	-7942.3	39.99	.81	14	5
28	8645.0	-8644.8	39.96	.89	14	7
29	8924.1	-9318.2	39.99	.95	14	7
30	9221.8	-9987.0	40.07	1.01	14	5
31	9534.5	-10648.8	40.09	1.06	14	5
32	9849.8	-11309.4	40.06	1.11	14	5
33	10159.5	-11972.7	40.01	1.17	14	5
34	10459.8	-12640.3	39.95	1.22	14	5
35	10707.1	-13324.6	40.08	1.30	14	7
36	10823.6	-13671.6	40.00	1.34	14	7
37	10859.5	-13851.0	39.94	1.36	14	8
38	10697.0	-13781.2	40.03	1.39	14	13
39	10220.6	-13230.8	40.03	1.40	14	7
40	9797.0	-12637.0	40.02	1.39	14	7
41	9382.2	-12033.8	39.95	1.38	14	5
42	8976.7	-11424.4	39.93	1.37	14	5
43	8574.5	-10812.8	39.92	1.35	14	5
44	8174.3	-10199.9	39.94	1.33	14	5
45	7770.1	-9589.5	40.01	1.32	14	5
46	7323.7	-9014.4	39.99	1.31	14	7
47	6763.0	-8553.3	39.98	1.34	14	7
48	6157.5	-8146.6	39.99	1.39	14	7
49	5908.3	-7882.6	39.99	1.39	14	10
50	5648.8	-7200.8	39.98	1.36	14	8

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
51	5388.6	-6521.0	39.97	1.32	14	7
52	5058.8	-5870.7	39.98	1.30	14	7
53	4742.9	-5214.9	39.95	1.27	14	7
54	4451.3	-4543.5	40.08	1.24	14	5
55	4067.5	-3926.7	39.96	1.23	14	7
56	3536.6	-3430.8	39.96	1.23	14	7
57	3050.3	-2891.7	40.01	1.22	14	7
58	2650.7	-2282.4	39.99	1.21	14	7
59	2261.6	-1664.5	40.00	1.20	14	7
60	1881.4	-1039.0	39.95	1.18	14	5
61	1357.6	-531.2	39.98	1.17	14	7
62	635.1	-430.1	39.93	1.18	14	8
63	-93.9	-453.9	39.95	1.19	14	7
64	-389.0	-255.5	39.91	1.19	14	10
65	-468.8	-91.9	39.95	1.19	14	13
66	-479.4	90.8	39.91	1.19	14	13
67	-286.7	388.3	39.91	1.19	14	10
68	50.3	501.3	39.91	1.20	14	10
69	771.5	595.8	39.95	1.20	14	7
70	834.8	946.2	39.95	1.20	14	11
71	541.4	1611.2	39.95	1.18	14	7
72	274.9	2293.0	39.91	1.17	14	5
73	17.4	2978.2	40.07	1.16	14	5
74	-276.0	3646.8	40.00	1.14	14	7
75	-527.1	4334.3	40.02	1.13	14	5
76	-832.7	4999.5	39.97	1.11	14	5
77	-1123.1	5671.4	40.04	1.09	14	5
78	-1437.6	6332.4	39.93	1.07	14	5
79	-1734.9	7001.3	40.04	1.06	14	5
80	-2059.5	7657.4	40.05	1.04	14	5
81	-2385.0	8313.1	40.05	1.02	14	5
82	-2710.8	8968.6	40.04	1.00	14	5
83	-3035.0	9624.8	40.05	.98	14	5
84	-3359.2	10281.2	40.04	.96	14	5
85	-3681.5	10938.4	40.03	.94	14	5
86	-4001.3	11596.8	40.02	.92	14	5
87	-4317.8	12256.9	40.01	.90	14	5
88	-4631.2	12918.4	39.99	.88	14	5
89	-4938.7	13582.7	39.97	.86	14	5
90	-5237.9	14250.7	39.94	.85	14	5
91	-5487.5	14934.5	40.03	.85	14	7
92	-5741.1	15621.2	39.94	.85	14	5
93	-5783.3	15799.3	39.93	.86	14	8
94	-5770.8	15981.8	39.91	.88	14	12
95	-5612.2	15890.4	39.94	.92	14	13
96	-5156.1	15317.9	40.09	.99	14	7
97	-4687.2	14755.8	39.98	1.07	14	5
98	-4262.2	14159.8	39.94	1.13	14	5
99	-3852.0	13553.5	39.91	1.19	14	5
100	-3467.3	12933.4	40.01	1.24	14	7

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO

PNT	X COORD.	Y COORD.	NEF DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
101	-3070.4	12318.3	39.99	1.29	14	5
102	-2676.7	11701.2	39.98	1.34	14	5
103	-2286.4	11082.0	39.97	1.40	14	5
104	-1898.5	10461.2	39.96	1.45	14	5
105	-1512.4	9839.3	39.96	1.50	14	5
106	-1126.8	9217.1	39.96	1.55	14	5
107	-740.8	8595.1	39.94	1.60	14	5
108	-356.1	7972.4	39.94	1.65	14	5
109	29.5	7350.2	40.00	1.70	14	5
110	436.4	6741.7	40.04	1.76	14	5
111	844.0	6136.2	39.99	1.81	14	7
112	1257.1	5531.9	39.98	1.87	14	5
113	1688.0	4945.2	40.00	1.92	14	7
114	2123.4	4360.1	39.99	1.98	14	7
115	2532.1	3755.6	39.99	2.03	14	7
116	2964.9	3165.2	40.07	2.09	14	5
117	3371.3	2561.2	39.99	2.14	14	7
118	3729.6	1925.3	40.00	2.20	14	7
119	4123.3	1311.9	39.99	2.25	14	7
120	4554.9	724.0	39.99	2.31	14	7
121	5159.4	311.3	40.02	2.35	14	7
122	5520.2	262.6	39.96	2.36	14	11
123	6223.2	446.4	39.95	2.34	14	7
124	6941.1	338.8	39.98	2.36	14	8
125	7667.2	337.3	39.92	2.36	14	7
126	8393.1	293.3	39.95	2.37	14	8
127	9123.1	262.5	39.96	2.38	14	7
128	9853.2	286.9	39.98	2.38	14	7
129	10582.4	269.7	39.96	2.39	14	8
130	11314.0	246.2	39.93	2.40	14	5
131	12044.3	211.4	40.00	2.41	14	7
132	12775.5	177.1	39.92	2.42	14	5
133	13499.4	97.2	40.03	2.44	14	8
134	13906.3	0.0	40.10	2.46	14	1

HE PREVIOUS CONTOUR IS NUMBER 2 IN FILE NUMBER 2

PREVIOUS CONTOUR REQUIRED 150.00 SEC. TO COMPUTE

FIGURE A-2. CONTOUR ANALYSIS REPORT FOR CASE #1 (CONT)

```
EXAMPLE AIRPORT SCENARIO
LDN
100   1              AIRPORT SECTION
        0.        15.0
  1  10000.        0.
  2      0.        0.                      0.        0.
  3   7000.    -7000.                  10000.        0.          27  9 T.O. RWY 27
  4   2000.     2000.                   2000.     2000.           9 27 T.O. RWY  9
                                        7000.    -7000.          31 13 T.O. RWY 31
                                                                 13 31 T.O. RWY 13
 1 1 1  50.
 1 2 3    .5  45.  1.5  50.
 2 3 1  50.
 2 4 5    .5  90. -1.5  1.5   0.  45. -1.5  50.
 2 5 1  50.
 2 6 3    .5  10.  1.5  50.
 4 7 3    .5  30. -1.5  50.
 4 8 3  1.0   30. -1.5  50.
 4 9 1  50.

107               AIRCRAFT SELECTION SECTION
 3. 5. 8.43
 17 AIRCRAFT X
101 AIRCRAFT Y              15101 27 28 29 30 31 32 32
102 AIRCRAFT Z     ,        101102201201202202  0  0  0
                             20 18 38 28 39 29
101                  PROFILE SECTION
 18  1                 REPLACEMENT B727-200 T.O. PROFILE
0.        5000.   25000.  50000.  75000.  100000. 150000.
0.        0.      2000.   4500.   7000.   9500.   14500.
32.       160.    160.    160.    160.    160.    160.      3.
15000.    15000.  15000.  15000.  15000.  15000.            120000.
201  1               AIRCRAFT Y SHORT RANGE T.O. PROFILE
0.        5000.   25000.  50000.  75000.  100000. 150000.
0.        0.      2000.   4500.   7000.   9500.   14500.
32.       200.    200.    200.    200.    200.    200.      3.
30000.    30000.  30000.  30000.  30000.  30000.            300000.
202  1               AIRCRAFT Y LONG RANGE T.O. PROFILE
0.        10000.  20000.  50000.  70000.  100000. 150000.
0.        0.      2000.   4000.   6000.   9000.   14000.
32.       250.    250.    250.    250.    250.    250.      3.
30000.    30000.  30000.  30000.  30000.  30000.            350000.
301               STANDARD 3 DEGREE APPROACH
   -1.0    -.165    2.575    5.255   12.395   18.675
    0.0     0.0     1000.    3000.    4000.    5000.
   32.     -2.      -2.      -2.      -2.      -2.
  -10.     -3.      -6.      -6.      -6.
302               STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
   -1.0    -.165    2.575    5.255   12.      15.14
    0.0     0.0     1000.    3000.    3000.    4000.
   32.     -2.      -2.      -2.      -2.      -2.
  -10.     -3.      -6.      -5.      -6.
303               GA. 3 DEGREE APPROACH
   -1.0    -.165    2.575    5.255   12.395   18.675
    0.0     0.0     1000.    3000.    4000.    5000.
   32.     -2.      -2.      -2.      -2.      -2.
   -3.     -3.      -3.      -3.      -3.
108
101               ALTERNATIVE APPROACH PARAMETERS SECTION
ACFT X        100000.   4.
5000.   150.    10000.
102                                                10000.
ACFT Y        200000.   3.                                                      15000.
3000.   180.    15000.  8000.   10000.  12000.  7000.   7500.   4000.   20000.
102
101               ALTERNATIVE NOISE VS DISTANCE SECTION
                  TABLES FOR AIRCRAFT Y
EPNL
30000.  105.    100.    95.     90.     85.     80.     75.     70.
20000.  100.    95.     90.     85.     80.     75.     70.     65.
10000.  95.     90.     85.     80.     75.     70.     65.     60.
NEL
30000.  100.    95.     90.     85.     80.     75.     70.     65.
20000.  95.     90.     85.     80.     75.     70.     65.     60.
10000.  90.     85.     80.     75.     70.     65.     60.     55.

100   3              AIRCRAFT MIX SECTION
  3 7                 3. 1. 1. 2.1.5
  3 8
  3 9301 4. 4. 4.                      3. 1. 1. 2.   1.5
  5 6302 4. 3. 2. 2. 1.       2. 1.    2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.      1. 3.    1. 1.
 17 1301 5. 2. 1.
 43 4               25. 5.10.          2.    2.
 43 230325. 5.10.                                          2.     2.
101 5302 8. 1. 1.
102 3301 4.         2.        1.        8. 1. 1.
                                        1.
103                 TAKEOFF PROFILE MODIFICATION SECTION
           1
  1  1            3000.      10.    3
  2  5      .04      3.    8000.    7    8

CONTOUR
65.
-75.
END
```

FIGURE A-3. INPUT CASE #2 - LDN CONTOURS

```
FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO                                                                              07/30/79.
LDN
PRIMARY  2=LDN    FACTORS 49.4  1.0 10.0
ALTERNATES  *NONE*
------------------------------------------------------------------------------------------
I     I           I           I          I CONTOUR I        I                  I
I PNT I     X     I     Y     I   LDN    I  AREA   I FLTS I ITERATIONS I
I     I  COORD.   I  COORD.   IDECIBELS I SQ. MI. I USED I                   I
------------------------------------------------------------------------------------------

1000  1  0.000         AIRPORT SECTION


                         AIRPORT ALTITUDE=      0. FT ABOVE MSL          AMBIENT TEMP= 15.DEG C


RUNWAY  1    10000.00        0.00        0.00        0.00        0.00        0.00   27  9 T.O. RWY 27          LENGTH = 10000.
RUNWAY  2        0.00        0.00        0.00    10000.00        0.00        0.00    9 27 T.O. RWY  9          LENGTH = 10000.
RUNWAY  3     7000.00    -7000.00        0.00     2000.00     2000.00        0.00   31 13 T.O. RWY 31          LENGTH = 10296.
RUNWAY  4     2000.00     2000.00        0.00     7000.00    -7000.00        0.00   13 31 T.O. RWY 13          LENGTH = 10296.
TRACK DATA  1 1 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  1 2 3    .50  45.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  3 3 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 4 5    .50  90.00  -1.50   1.50   0.00  45.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 5 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 6 3    .50  10.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 7 3    .50  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 8 3   1.00  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 9 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00

1070  0  0.000        AIRCRAFT SELECTION SECTION

THE FOLLOWING AIRCRAFT ARE RETRIEVED AS THEY APPEAR IN THE DATA BASE:
   3  5  8 43
NEW OR REPLACEMENT AIRCRAFT DEFINITIONS:
 AC     NAME                 NC APP    T. O. P R O F I L E S
 17   AIRCRAFT X             19 101  27  28  29  30  31  32  32
101   AIRCRAFT Y            101 102 201 201 202 202   0   0   0
102   AIRCRAFT Z             20  18  38  28  39  29   0   0   0

1010  0  0.000        PROFILE SECTION

PROFILE  18  (FEET)                   REPLACEMENT B727-200 T.O. PROFILE
     0.00    5000.00   25000.00   50000.00   75000.00 100000.00 150000.00       0.00   0.00000       0.00
     0.00       0.00    2000.00    4500.00    7000.00   9500.00  14500.00       0.00   0.00000       0.00
    32.00     160.00     160.00     160.00     160.00    160.00    160.00       3.00   0.00000       0.00
 15000.00   15000.00   15000.00   15000.00   15000.00  15000.00      0.00  120000.00   0.00000       0.00
PROFILE 201  (FEET)                  AIRCRAFT Y SHORT RANGE T.O. PROFILE
     0.00    5000.00   25000.00   50000.00   75000.00 100000.00 150000.00       0.00      0.00       0.00
     0.00       0.00    2000.00    4500.00    7000.00   9500.00  14500.00       0.00      0.00       0.00
    32.00     200.00     200.00     200.00     200.00    200.00    200.00       3.00      0.00       0.00
 30000.00   30000.00   30000.00   30000.00   30000.00  30000.00      0.00  300000.00      0.00       0.00
PROFILE 202  (FEET)                  AIRCRAFT Y LONG RANGE T.O. PROFILE
     0.00   10000.00   20000.00   50000.00   70000.00 100000.00 150000.00       0.00      0.00       0.00
     0.00       0.00    2000.00    4000.00    6000.00   9000.00  14000.00       0.00      0.00       0.00
    32.00     250.00     250.00     250.00     250.00    250.00    250.00       3.00      0.00       0.00
 30000.00   30000.00   30000.00   30000.00   30000.00  30000.00      0.00  350000.00      0.00       0.00
PROFILE 301  (N.M.)               STANDARD 3 DEGREE APPROACH
    -1.00       -.17       2.98       9.26      12.40     18.68      0.00       0.00      0.00       0.00
     0.00       0.00    1000.00    3000.00    4000.00   5000.00      0.00       0.00      0.00       0.00
    32.00      -2.00      -2.00      -2.00      -2.00     -2.00      0.00       0.00      0.00       0.00
   -10.00      -3.00      -6.00      -6.00      -6.00      0.00      0.00       0.00      0.00       0.00
```

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2

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PROFILE 102 (N.M.)              STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
     -1.00      -.17      2.98      5.26     12.00     15.14
      0.00      0.00   1000.00   3000.00   3000.00   4000.00      0.00      0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
    -10.00     -3.00     -6.00     -5.00     -6.00      0.00      0.00      0.00      0.00      0.00
PROFILE 303 (N.M.)              GA. 3 DEGREE APPROACH                 0.00      0.00      0.00      0.00
     -1.00      -.17      2.98      5.26     12.40     18.68
      0.00      0.00   1000.00   3000.00   4000.00   5000.00      0.00      0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00      0.00
     -3.00     -3.00     -3.00     -3.00     -3.00      0.00      0.00      0.00      0.00      0.00
1080  0  0.000        ALTERNATIVE APPROACH PARAMETERS SECTION                0.00      0.00      0.00

APPROACH PARAMETERS

                                                     *THRUSTS*
TYPE  AIRCRAFT    LDG ROLL    SPEED      3 DEG L    6 DEG L    LEVEL A    3 DEG A    LEVEL M   500FT/NM      IDLE     REVERSE     WEIGHT   NF
101 ACFT X          5000.      150.      10000.        0.         0.      10000.         0.         0.         0.      15000.     100000.  4.
102 ACFT Y          3000.      180.      15000.      8000.     10000.     12000.      7000.      7500.      4000.      20000.     200000.  3.
1020  0  0.000        ALTERNATIVE NOISE VS DISTANCE SECTION

NOISE CURVE NUMBER 101             TABLES FOR AIRCRAFT Y
                                      VALUES OF EPNL
  THRUST      200 FT    400 FT    600 FT   1000 FT   2000 FT   4000 FT   6000 FT  10000 FT
  30000.0     105.00    100.00     95.00     90.00     85.00     80.00     75.00     70.00
  20000.0     100.00     95.00     90.00     85.00     80.00     75.00     70.00     65.00
  10000.0      95.00     90.00     85.00     80.00     75.00     70.00     65.00     60.00
                                      VALUES OF NEL
  THRUST      200 FT    400 FT    600 FT   1000 FT   2000 FT   4000 FT   6000 FT  10000 FT
  30000.0     100.00     95.00     90.00     85.00     80.00     75.00     70.00     65.00
  20000.0      95.00     90.00     85.00     80.00     75.00     70.00     65.00     60.00
  10000.0      90.00     85.00     80.00     75.00     70.00     65.00     60.00     55.00
1000  3  0.000        AIRCRAFT MIX SECTION

MIX DATA
          *                   *                   *                   *                   *                   *                   *                   *
  3   7   0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3   8   0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  0.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3   9 301  9.0  4.0  4.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  5   6 302  4.0  3.0  2.0  2.0  1.0  0.0  2.0  1.0  0.0  2.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  8   3 301 10.0  2.0  5.0  5.0  1.0  3.0  2.0  0.0  1.0  3.0  0.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 17   1 301  5.0  2.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  2.0  0.0  2.0  0.0  0.0  0.0  2.0  0.0  2.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 43   4   0  0.0  0.0  0.0 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 43   2 303 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
101   5 302  8.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  8.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
102   3 301  4.0  0.0  0.0  2.0  0.0  0.0  1.0  0.0  0.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0

                         FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
                    EXAMPLE AIRPORT SCENARIO
A/C    A/C NAME            NC      ARRIVALS      0- 500    500-1000   1000-1500   1500-2500   2500-3500   3500-4500   4500- UP     07/30/79.

 3              BAC-111     2   D     9.0  48      3.0  49     2.0  49     3.0  49     2.0   0     0.0   0     0.0   0     0.0
                                E     4.0          1.0         1.5         1.0         0.0         0.0         0.0         0.0
                                N     4.0          1.0         0.0         1.0         1.5         0.0         0.0         0.0

 5 3E NBTF      727-200     8   D     4.0  18      2.0  20     2.0  20     2.0  20     0.0   0     0.0   0     0.0   0     0.0
                                E     3.0          1.0         1.0         1.0         0.0         0.0         0.0         0.0
                                N     2.0          0.0         0.0         0.0         0.0         0.0         0.0         0.0

 8              707-120B   11   D    10.0  38      5.0  39     2.0  40     3.0  41     1.0  42     0.0  42     0.0  42     0.0
                                E     2.0          1.0         0.0         0.0         0.0         0.0         0.0         0.0
                                N     5.0          3.0         1.0         1.0         0.0         0.0         0.0         0.0
```

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

```
 17  AIRCRAFT X        15  D     5.0  27    0.0  28    0.0  29    2.0  30    0.0  31    2.0  32    0.0  32    0.0
                           E     2.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
                           N     1.0        0.0        0.0        2.0        0.0        2.0        0.0        0.0

 43 MSEP6              26  D    25.0  91   25.0   0    0.0   0    0.0   0    0.0   0    0.0   0    0.0   0    0.0
                           E     5.0        5.0        0.0        0.0        0.0        0.0        0.0        0.0
                           N    10.0       10.0        0.0        0.0        0.0        0.0        0.0        0.0

101  AIRCRAFT Y       101  D     8.0 201    0.0 201    0.0 202    8.0 202    0.0   0    0.0   0    0.0   0    0.0
                           E     1.0        0.0        0.0        1.0        0.0        0.0        0.0        0.0
                           N     1.0        0.0        0.0        1.0        0.0        0.0        0.0        0.0

102  AIRCRAFT Z        20  D     4.0  38    2.0  28    1.0  34    1.0  29    0.0   0    0.0   0    0.0   0    0.0
                           E     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0
                           N     0.0        0.0        0.0        0.0        0.0        0.0        0.0        0.0


                FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
           EXAMPLE AIRPORT SCENARIO

   RUNWAY UTILIZATION

  RUNWAYS-        27      9     31     13    TOT

   TAKEOFFS  D    4.0   39.0   15.0   10.0   68.0
   (ACTUAL)  E    0.0    9.0    1.0    3.5   13.5
             N    4.0   11.0    5.0    3.5   23.5

   TAKEOFFS  D    3.8   37.1   14.3    9.5
   (PERCENT) E    0.0    8.6    1.0    3.3
             N    3.8   10.5    4.8    3.3

   LANDINGS  D   12.0   30.0    9.0   14.0   65.0
   (ACTUAL)  E    4.0    7.0    4.0    2.0   17.0
             N    3.0   11.0    4.0    5.0   23.0

   LANDINGS  D   11.4   28.6    8.6   13.3
   (PERCENT) E    3.8    6.7    3.8    1.9
             N    2.9   10.5    3.8    4.8

   TOTAL  TAKEOFFS  105.0  LANDINGS  105.0

  TOTAL OPERATIONS - DAILY   210.  - YEARLY   76650.
  DEFAULT RUNWAY  2   9

   TOTAL FLIGHTS    23

  1030  0  0.000     TAKEOFF PROFILE MODIFICATION SECTION

  ALTITUDE RESTRICTION/CUTBACK DATA
  C/P OVERRIDE ARRAY:0000000000100000000000000000000000000000000000
  RESTRICTION   1  1     0.00000  3000.00000    10.00000   3  0  0  0  0  0  0  0  0  0
  RESTRICTION   2  5      .04000     3.00000  8000.00000   7  8  0  0  0  0  0  0  0  0

   00  0  0.000

   CONTOUR
```

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO 07/30/79.
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

CONTOUR VALUE 65.00
TOLERANCE .100
START POINT 0.00 0.00 AUTO-START
STEP SIZE 1275.00

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
1	24687.5	0.0	65.06	0.00	23	14
2	25919.4	-328.6	65.05	.15	23	5
3	27149.8	-662.9	65.05	.29	23	5
4	28293.5	-1203.9	65.00	.54	23	7
5	29508.7	-1589.8	64.98	.71	23	5
6	30716.9	-1996.9	64.96	.89	23	5
7	31914.1	-2435.6	64.92	1.09	23	5
8	32923.2	-3214.9	65.08	1.49	23	7
9	33106.6	-3475.6	65.02	1.64	23	8
10	32521.7	-3729.1	65.01	1.83	23	10
11	31261.2	-3839.6	65.01	1.97	23	7
12	29987.3	-3890.8	64.96	2.09	23	5
13	28712.3	-3880.8	64.93	2.17	23	5
14	27438.0	-3838.3	64.96	2.24	23	5
15	26170.2	-3907.9	65.00	2.36	23	7
16	24899.9	-3799.1	64.99	2.40	23	5
17	23630.1	-3684.0	64.99	2.44	23	5
18	22360.4	-3568.3	64.99	2.47	23	5
19	21090.7	-3451.1	64.99	2.50	23	5
20	19832.8	-3617.2	64.99	2.65	23	7
21	18561.6	-3518.5	65.04	2.69	23	5
22	17287.4	-3475.1	65.06	2.76	23	5
23	16024.2	-3562.8	64.99	2.86	23	7
24	14786.2	-3821.6	64.99	3.02	23	7
25	13633.6	-4341.3	65.00	3.23	23	7
26	12472.7	-4851.6	65.00	3.45	23	7
27	11408.5	-5533.9	65.00	3.70	23	7
28	11196.2	-6115.0	65.00	3.84	23	10
29	11288.8	-7376.0	64.99	4.08	23	7
30	11604.9	-8600.8	64.99	4.28	23	7
31	12122.1	-9766.2	65.01	4.45	23	5
32	12696.9	-10897.5	64.99	4.59	23	7
33	13075.3	-12105.4	64.99	4.79	23	7
34	12681.1	-13306.6	64.95	5.16	23	7
35	12699.8	-13922.5	64.97	5.30	23	10
36	13381.3	-15000.1	64.99	5.37	23	5
37	14007.0	-16100.7	65.00	5.47	23	7
38	14000.9	-17375.7	65.00	5.79	23	7
39	14394.8	-18576.8	64.95	5.97	23	7
40	14857.3	-19764.9	65.08	6.12	23	5
41	15365.1	-20934.5	65.08	6.25	23	5
42	15618.5	-21519.4	65.07	6.32	23	8
43	15619.4	-21836.1	65.00	6.41	23	14
44	15073.1	-22144.6	64.99	6.71	23	10
45	14623.6	-21723.7	65.05	6.77	23	11
46	13904.5	-20670.8	64.99	6.78	23	5
47	13204.1	-19605.4	64.95	6.77	23	5
48	12514.4	-18533.1	64.94	6.76	23	5
49	11824.4	-17460.9	64.98	6.75	23	5
50	11125.0	-16394.8	65.01	6.74	23	5

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
51	10726.8	-15901.5	64.99	6.76	23	11
52	9528.3	-15480.5	64.99	7.02	23	8
53	8457.6	-14788.2	64.95	7.20	23	8
54	7725.8	-13753.9	64.99	7.24	23	7
55	7023.7	-12689.7	64.96	7.26	23	5
56	6327.8	-11621.3	64.99	7.29	23	5
57	5614.8	-10564.3	65.01	7.31	23	5
58	4872.2	-9527.9	65.06	7.35	23	5
59	4306.5	-8396.8	64.99	7.35	23	7
60	4029.4	-7163.3	64.97	7.29	23	7
61	3575.4	-5977.7	64.99	7.27	23	7
62	2986.6	-4856.7	64.97	7.26	23	7
63	2564.7	-4408.2	64.98	7.27	23	10
64	1289.8	-4422.0	64.95	7.37	23	8
65	151.5	-4973.1	64.99	7.48	23	7
66	-1004.4	-5489.6	65.00	7.58	23	7
67	-2205.4	-5895.8	65.00	7.69	23	7
68	-3444.7	-6165.7	65.00	7.81	23	7
69	-4702.0	-6331.1	65.00	7.94	23	7
70	-5875.6	-5855.6	64.99	8.11	23	8
71	-7031.0	-5342.0	65.00	8.29	23	8
72	-8230.6	-4933.3	64.99	8.46	23	8
73	-9127.0	-4033.9	64.97	8.67	23	7
74	-10402.0	-4032.6	64.97	8.76	23	5
75	-11677.0	-4027.0	64.95	8.85	23	5
76	-12951.8	-4004.4	64.92	8.95	23	5
77	-14226.1	-3963.2	64.91	9.05	23	5
78	-15500.4	-3919.1	64.91	9.15	23	5
79	-16774.6	-3873.2	64.91	9.26	23	5
80	-18048.6	-3823.7	64.90	9.36	23	5
81	-19314.6	-3725.5	65.00	9.48	23	7
82	-20588.0	-3663.4	65.00	9.58	23	5
83	-21861.4	-3599.5	64.99	9.69	23	5
84	-23134.7	-3533.7	64.99	9.80	23	5
85	-24407.9	-3466.0	64.99	9.91	23	5
86	-25680.8	-3392.7	64.98	10.02	23	5
87	-26953.7	-3319.1	64.98	10.13	23	5
88	-28226.5	-3244.9	64.98	10.24	23	5
89	-29499.4	-3170.2	64.98	10.35	23	5
90	-30772.1	-3094.8	64.98	10.47	23	5
91	-32044.8	-3018.6	64.98	10.58	23	5
92	-33317.5	-2941.5	64.98	10.69	23	5
93	-34590.1	-2863.5	64.98	10.81	23	5
94	-35862.7	-2784.3	64.98	10.92	23	5
95	-37135.1	-2703.7	64.98	11.04	23	5
96	-38407.5	-2621.7	64.97	11.15	23	5
97	-39679.7	-2537.9	64.97	11.27	23	5
98	-40951.8	-2452.2	64.97	11.39	23	5
99	-42223.8	-2364.1	64.97	11.51	23	5
100	-43495.6	-2273.4	64.97	11.63	23	5

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
101	-44767.1	-2179.7	64.96	11.76	23	5
102	-46038.4	-2082.4	64.96	11.88	23	5
103	-47309.3	-1980.9	64.96	12.02	23	5
104	-48579.9	-1874.4	64.95	12.15	23	5
105	-49849.9	-1762.1	64.95	12.29	23	5
106	-51100.5	-1560.5	65.00	12.51	23	7
107	-52352.3	-1318.2	65.06	12.77	23	5
108	-53617.4	-1159.3	65.05	12.95	23	5
109	-54836.2	-824.0	65.01	13.30	23	7
110	-56011.9	-330.7	65.06	13.80	23	5
111	-56572.0	-26.2	65.02	14.11	23	7
112	-56328.7	563.0	64.91	14.71	23	10
113	-55055.1	622.2	65.09	14.78	23	7
114	-53909.9	1158.7	65.01	15.32	23	7
115	-52647.8	1339.5	64.99	15.52	23	5
116	-51382.5	1496.3	65.02	15.70	23	5
117	-50131.0	1740.3	64.94	15.96	23	5
118	-48861.8	1861.1	64.93	16.11	23	5
119	-47591.8	1974.2	64.93	16.25	23	5
120	-46321.3	2081.1	64.92	16.38	23	5
121	-45050.4	2182.9	64.92	16.52	23	5
122	-43779.1	2280.3	64.92	16.65	23	5
123	-42507.5	2374.1	64.92	16.77	23	5
124	-41235.8	2464.7	64.91	16.89	23	5
125	-39963.8	2552.7	64.91	17.02	23	5
126	-38691.7	2638.4	64.91	17.13	23	5
127	-37419.4	2722.0	64.91	17.25	23	5
128	-36147.1	2804.0	64.91	17.37	23	5
129	-34874.6	2884.4	64.90	17.49	23	5
130	-33602.1	2963.6	64.90	17.60	23	5
131	-32329.5	3041.6	64.90	17.72	23	5
132	-31056.8	3118.6	64.90	17.83	23	5
133	-29784.1	3194.8	64.90	17.94	23	5
134	-28514.8	3221.7	65.00	18.03	23	7
135	-27242.0	3297.0	65.00	18.14	23	5
136	-25969.2	3371.7	65.00	18.25	23	5
137	-24696.4	3446.2	65.00	18.37	23	5
138	-23423.5	3520.3	64.99	18.48	23	5
139	-22150.4	3589.5	64.99	18.59	23	5
140	-20877.2	3657.1	64.99	18.70	23	5
141	-19603.9	3723.6	64.99	18.80	23	5
142	-18330.7	3790.5	64.98	18.91	23	5
143	-17057.0	3846.9	64.98	19.02	23	5
144	-15783.1	3901.7	64.98	19.12	23	5
145	-14509.3	3955.5	64.98	19.23	23	5
146	-13235.6	4012.9	64.99	19.33	23	5
147	-11962.6	4084.3	65.04	19.44	23	5
148	-10693.5	4207.0	64.97	19.56	23	5
149	-9420.7	4132.2	64.96	19.64	23	5
150	-8821.3	4273.3	64.99	19.71	23	10

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
151	-8092.0	5306.8	65.00	19.93	23	8
152	-7510.8	5511.7	65.00	20.02	23	11
153	-6272.5	5766.9	64.99	20.17	23	7
154	-5534.6	6798.6	65.00	20.36	23	8
155	-4954.5	7006.2	65.00	20.46	23	11
156	-4090.7	7944.0	64.99	20.65	23	8
157	-4231.0	9211.3	65.06	20.72	23	7
158	-4674.7	10399.0	64.99	20.74	23	7
159	-5132.3	11569.0	65.09	20.75	23	5
160	-5610.8	12766.8	64.99	20.76	23	7
161	-6130.8	13930.9	65.07	20.76	23	5
162	-6678.3	15082.4	64.97	20.75	23	5
163	-7198.3	16241.6	64.99	20.75	23	7
164	-7470.2	17481.5	65.00	20.83	23	7
165	-8007.3	18637.9	64.96	20.81	23	5
166	-8524.6	19803.2	64.92	20.81	23	5
167	-8941.9	20999.5	65.06	20.84	23	7
168	-9145.8	21603.5	65.01	20.86	23	7
169	-9218.7	21913.8	64.98	20.89	23	8
170	-9239.6	22231.9	64.92	20.93	23	8
171	-8973.3	22056.6	64.97	21.01	23	13
172	-8150.4	21092.7	65.04	21.18	23	7
173	-7396.6	20069.4	65.02	21.31	23	7
174	-6666.9	19023.8	64.96	21.44	23	5
175	-5916.0	18001.3	64.99	21.57	23	7
176	-5055.7	17074.3	64.97	21.75	23	7
177	-4359.2	16012.3	64.98	21.87	23	7
178	-3673.2	14937.6	65.04	21.98	23	5
179	-2997.6	13856.3	65.05	22.09	23	5
180	-2249.7	12832.8	64.98	22.22	23	7
181	-1555.7	11763.2	64.99	22.34	23	5
182	-854.0	10698.7	65.02	22.46	23	5
183	-142.2	9640.9	65.06	22.58	23	5
184	590.4	8597.4	65.03	22.70	23	5
185	1356.7	7565.8	64.99	22.83	23	7
186	2270.1	6712.0	64.98	22.98	23	7
187	3253.5	5916.8	64.99	23.13	23	7
188	4297.8	5197.4	64.99	23.28	23	7
189	5376.1	4536.8	64.99	23.43	23	7
190	6618.2	4281.3	64.99	23.56	23	7
191	7862.0	4051.4	64.99	23.68	23	7
192	9111.2	4264.3	64.99	23.74	23	7
193	10215.6	4879.8	64.99	23.72	23	7
194	11477.4	4776.4	64.99	23.85	23	7
195	12710.7	4490.3	65.00	24.02	23	7
196	13881.2	4006.9	65.00	24.22	23	7
197	15028.1	3449.9	64.93	24.44	23	5
198	16158.1	2859.3	65.04	24.67	23	5
199	17366.2	2480.1	64.99	24.84	23	7
200	18590.4	2124.0	65.02	25.01	23	5

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

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FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S),
                                                                 TAKEOFF PROFILE(S),
                                                                 AND NOISE CURVE(S).
```

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
201	19810.1	1752.7	64.93	25.18	23	5
202	20983.0	1268.6	64.99	25.39	23	7
203	22119.9	714.4	64.99	25.62	23	7
204	23349.3	376.6	65.01	25.77	23	5
205	24581.7	49.6	65.01	25.92	23	5
206	24687.5	0.0	65.01	25.94	23	0

THE PREVIOUS CONTOUR IS NUMBER 1 IN FILE NUMBER 2

PREVIOUS CONTOUR REQUIRED 150.00 SEC. TO COMPUTE

```
FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
 EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S),
                                                            TAKEOFF PROFILE(S),
CONTOUR VALUE -75.00
TOLERANCE  .100                                             AND NOISE CURVE(S).
START POINT        0.00        0.00   AUTO-START
STEP SIZE       820.00
STOP POINT        0.00        0.00
MAX. POINTS    250
ERROR CODE      0
```

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
1	15468.8	0.0	75.04	0.00	23	16
2	16249.5	-250.5	74.95	.07	23	5
3	16600.0	-463.4	74.99	.13	23	11
4	16420.0	-561.7	74.99	.16	23	12
5	15607.0	-566.0	75.03	.17	23	7
6	14787.4	-542.6	74.98	.17	23	5
7	13970.5	-534.1	74.95	.18	23	7
8	13161.6	-629.0	74.98	.21	23	7
9	12382.9	-863.5	74.99	.27	23	7
10	11689.7	-1288.3	74.99	.38	23	7
11	11004.9	-1730.5	74.96	.49	23	7
12	10224.3	-1957.4	74.96	.56	23	7
13	9431.6	-1768.6	74.98	.55	23	8
14	8632.1	-1612.3	74.98	.55	23	7
15	7819.3	-1547.0	74.98	.56	23	7
16	7004.1	-1570.7	74.98	.59	23	7
17	6197.0	-1687.3	74.98	.62	23	7
18	5804.0	-1782.7	74.99	.65	23	10
19	5656.7	-2151.1	74.95	.69	23	11
20	5799.5	-2951.6	74.90	.77	23	7
21	6214.1	-3652.6	74.92	.82	23	7
22	6671.4	-4333.2	75.02	.86	23	5
23	7057.9	-5052.0	74.96	.92	23	7
24	7466.3	-5756.9	74.95	.97	23	7
25	7970.6	-6398.1	74.97	1.00	23	7
26	8213.9	-7174.8	74.97	1.09	23	8
27	8317.5	-7985.2	74.99	1.19	23	7
28	8590.1	-8751.4	74.97	1.27	23	7
29	8906.0	-9508.1	75.08	1.34	23	5
30	9260.4	-10245.2	74.99	1.39	23	7
31	9606.3	-10988.7	74.96	1.45	23	5
32	9945.3	-11735.4	74.90	1.52	23	5
33	10210.7	-12505.4	75.02	1.60	23	8
34	10267.8	-12702.3	74.98	1.62	23	8
35	10299.3	-12904.9	74.91	1.65	23	8
36	10157.9	-12756.5	75.05	1.66	23	14
37	9623.8	-12143.4	75.05	1.67	23	8
38	9135.9	-11484.4	74.93	1.66	23	5
39	8683.6	-10802.3	74.99	1.64	23	7
40	8226.7	-10121.4	74.98	1.62	23	5
41	7771.5	-9439.4	75.01	1.60	23	5
42	7279.3	-8788.2	74.99	1.60	23	7
43	6676.0	-8243.3	74.97	1.62	23	7
44	6077.8	-7692.6	74.95	1.64	23	7
45	5786.3	-6927.6	74.99	1.60	23	7
46	5431.2	-6195.0	74.94	1.57	23	7
47	5020.5	-5485.3	75.02	1.54	23	5
48	4677.8	-4744.0	74.97	1.51	23	7
49	4345.3	-3998.7	74.95	1.48	23	7
50	4120.2	-3660.1	74.98	1.47	23	10

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
51	3550.0	-3075.4	74.99	1.46	23	7
52	3009.1	-2459.1	74.95	1.45	23	5
53	2648.5	-2268.6	75.00	1.46	23	11
54	1830.9	-2259.0	75.00	1.49	23	7
55	1016.4	-2302.5	74.99	1.53	23	7
56	209.5	-2423.7	75.01	1.56	23	7
57	-604.8	-2429.7	74.99	1.60	23	7
58	-1424.7	-2415.6	74.98	1.63	23	5
59	-2244.4	-2395.3	74.97	1.67	23	5
60	-3064.1	-2373.8	74.97	1.70	23	5
61	-3883.8	-2352.5	74.97	1.74	23	5
62	-4703.6	-2330.8	74.97	1.78	23	5
63	-5523.2	-2306.6	74.91	1.81	23	5
64	-6239.2	-1919.7	75.00	1.88	23	7
65	-7045.3	-1795.0	75.00	1.92	23	7
66	-7863.5	-1741.2	74.99	1.96	23	5
67	-8541.9	-1280.6	74.92	2.04	23	8
68	-9308.6	-989.7	74.91	2.10	23	7
69	-10126.7	-934.0	74.91	2.13	23	5
70	-10944.7	-877.4	74.90	2.15	23	5
71	-11758.1	-796.8	75.00	2.18	23	7
72	-12575.8	-736.0	74.99	2.20	23	5
73	-13393.3	-671.9	74.98	2.23	23	5
74	-14210.4	-603.0	74.97	2.26	23	5
75	-15026.7	-525.4	74.95	2.28	23	5
76	-15841.9	-437.0	74.93	2.32	23	5
77	-16638.5	-268.6	75.03	2.37	23	7
78	-17440.7	-98.9	74.92	2.42	23	5
79	-17437.8	106.1	74.92	2.49	23	11
80	-16638.8	290.1	74.98	2.55	23	7
81	-15833.8	446.5	74.90	2.60	23	5
82	-15020.6	508.6	75.01	2.62	23	7
83	-14205.6	599.0	74.99	2.65	23	5
84	-13389.3	676.7	74.97	2.68	23	5
85	-12572.2	745.5	74.96	2.71	23	5
86	-11754.7	809.5	74.95	2.74	23	5
87	-10936.9	870.5	74.94	2.76	23	5
88	-10119.0	929.1	74.94	2.78	23	5
89	-9301.0	986.7	74.94	2.81	23	5
90	-8535.6	1273.5	75.00	2.87	23	8
91	-7876.4	1761.2	74.96	2.96	23	5
92	-7058.2	1814.6	74.95	2.99	23	5
93	-6250.7	1921.5	75.00	3.03	23	7
94	-5523.6	2285.9	75.02	3.10	23	7
95	-4705.1	2335.5	75.01	3.14	23	8
96	-3885.6	2365.0	75.01	3.17	23	5
97	-3066.2	2396.6	75.02	3.21	23	5
98	-2247.2	2437.2	75.05	3.25	23	5
99	-1437.2	2535.1	75.00	3.29	23	7
100	-643.0	2712.3	74.99	3.33	23	7

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).

PNT	X COORD.	Y COORD.	LDN DECIBELS	CONTOUR AREA SQ. MI.	FLTS USED	ITERATIONS
101	21.1	3193.3	75.09	3.37	23	7
102	41.1	4013.1	75.04	3.37	23	7
103	-218.4	4784.0	74.95	3.35	23	7
104	-516.5	5545.3	74.97	3.33	23	7
105	-856.8	6288.2	74.98	3.30	23	7
106	-1207.5	7029.5	75.00	3.27	23	5
107	-1562.4	7768.7	74.97	3.24	23	5
108	-1909.9	8511.4	74.92	3.21	23	5
109	-2201.2	9273.2	75.02	3.20	23	8
110	-2335.3	9660.6	74.94	3.19	23	7
111	-2144.3	9586.0	75.07	3.22	23	13
112	-1629.4	8955.3	75.07	3.28	23	7
113	-1155.0	8286.5	74.94	3.34	23	5
114	-718.8	7594.0	75.01	3.39	23	7
115	-279.4	6901.7	75.01	3.44	23	5
116	160.6	6209.8	74.99	3.49	23	5
117	627.5	5538.8	74.99	3.55	23	7
118	1088.4	4865.5	74.97	3.60	23	7
119	1614.4	4242.8	74.98	3.66	23	7
120	2153.8	3629.5	75.00	3.72	23	7
121	2744.8	3068.7	74.98	3.78	23	7
122	3266.8	2445.3	74.98	3.84	23	7
123	3841.0	1868.9	74.98	3.89	23	7
124	4588.9	1547.5	74.97	3.94	23	7
125	5402.6	1542.1	74.97	3.96	23	7
126	6216.6	1641.5	74.91	3.98	23	5
127	7027.3	1556.0	74.98	4.01	23	7
128	7842.2	1540.8	74.98	4.04	23	7
129	8654.6	1610.1	74.98	4.05	23	7
130	9453.8	1770.4	74.98	4.05	23	7
131	10250.2	1946.6	74.95	4.04	23	7
132	11031.0	1715.9	74.96	4.11	23	7
133	11711.6	1271.0	74.99	4.22	23	7
134	12408.6	851.2	74.99	4.32	23	7
135	13188.4	620.9	74.98	4.39	23	7
136	13989.7	447.1	74.96	4.44	23	5
137	14775.7	225.7	74.99	4.50	23	7
138	15468.8	0.0	75.02	4.56	23	1

THE PREVIOUS CONTOUR IS NUMBER 2 IN FILE NUMBER 2

PREVIOUS CONTOUR REQUIRED 150.00 SEC. TO COMPUTE

FIGURE A-4. CONTOUR ANALYSIS REPORT FOR CASE #2 (CONT)

```
EXAMPLE AIRPORT SCENARIO GRID ANALYSIS
100    1            AIRPORT SECTION
      0.       15.0
  1   10000.      0.                 0.        0.            27  9 T.O. RWY 27
  2      0.       0.             10000.        0.             9 27 T.O. RWY  9
  3    7000.   -7000.             2000.     2000.            31 13 T.O. RWY 31
  4    2000.    2000.             7000.    -7000.            13 31 T.O. RWY 13

 1 1 1  50.
 1 2 3   .5  45.  1.5  50.
 3 3 1  50.
 2 4 5   .5  90. -1.5  1.5   0.  45. -1.5  50.
 2 5 1  50.
 2 6 3   .5  10.  1.5  50.
 4 7 3   .5  30. -1.5  50.
 4 8 3  1.0  30. -1.5  50.
 4 9 1  50.

107                AIRCRAFT SELECTION SECTION
 3. 5. 8.43
 17 AIRCRAFT X            19101 27 28 29 30 31 32 32
101 AIRCRAFT Y           101102201201202202  0  0  0
102 AIRCRAFT Z            20 18 38 28 35 29

101                PROFILE SECTION
 18   1             REPLACEMENT B727-200 T.O. PROFILE
0.        5000.   25000.  50000.  75000.  100000. 150000.
0.        0.      2000.   4500.   7000.   9500.   14500.
32.       160.    160.    160.    160.    160.    160.     3.
15000.  15000.  15000.  15000.  15000.  15000.            120000.
201  1              AIRCRAFT Y SHORT RANGE T.O. PROFILE
0.        5000.   25000.  50000.  75000.  100000. 150000.
0.        0.      2000.   4500.   7000.   9500.   14500.
32.       200.    200.    200.    200.    200.    200.     3.
30000.  30000.  30000.  30000.  30000.  30000.            300000.
202  1              AIRCRAFT Y LONG RANGE T.O. PROFILE
0.        10000.  20000.  50000.  70000.  100000. 150000.
0.        0.      2000.   4000.   6000.   9000.   14000.
32.       250.    250.    250.    250.    250.    250.     3.
30000.  30000.  30000.  30000.  30000.  30000.            350000.
301             STANDARD 3 DEGREE APPROACH
    -1.0    -.165   2.975   5.255  12.395  18.675
     0.0      0.0   1000.   3000.   4000.   5000.
     32.      -2.     -2.     -2.     -2.     -2.
    -10.      -3.     -6.     -6.     -6.
302             STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
    -1.0    -.165   2.975   5.255     12.   15.14
     0.0      0.0   1000.   3000.   3000.   4000.
     32.      -2.     -2.     -2.     -2.     -2.
    -10.      -3.     -6.     -5.     -6.
303             GA. 3 DEGREE APPROACH
    -1.0    -.165   2.975   5.255  12.395  18.675
     0.0      0.0   1000.   3000.   4000.   5000.
     32.      -2.     -2.     -2.     -2.     -2.
     -3.      -3.     -3.     -3.     -3.

108                ALTERNATIVE APPROACH PARAMETERS SECTION
101
ACFT X      100000.   4.
5000.   150.    10000.                       10000.                          15000.
102
ACFT Y      200000.   3.
3000.   180.    15000.  8000.   10000.  12000.  7000.   7500.   4000.   20000.

102                ALTERNATIVE NOISE VS DISTANCE SECTION
101                TABLES FOR AIRCRAFT Y
EPNL
30000.  105.    100.    95.     90.     85.     80.     75.     70.
20000.  100.    95.     90.     85.     80.     75.     70.     65.
10000.  95.     90.     85.     80.     75.     70.     65.     60.

NEL
30000.  100.    95.     90.     85.     80.     75.     70.     65.
20000.  95.     90.     85.     80.     75.     70.     65.     60.
10000.  90.     85.     80.     75.     70.     65.     60.     55.

100   3             AIRCRAFT MIX SECTION
  3 7                3. 1. 1. 2.1.5
  3 8                                   3. 1. 1. 2.   1.5
  3 9301 9. 4. 4.
  5 6302 4. 3. 2. 2. 1.     2. 1.     2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.    1. 3.     1. 1.
 17 1301 5. 2. 1.                       2.    2.           2.    2.
 43 4               25. 5.10.
 43 230325. 5.10.
101 5302 8. 1. 1.                       8. 1. 1.
102 3301 4.        2.        1.         1.

103                TAKEOFF PROFILE MODIFICATION SECTION
          1
  1  1              3000.     10.     3
  2  5      .04        3.   8000.     7     8

GRID               0.         1000.      1000.      1000.          2     5
END
```

FIGURE A-5. INPUT CASE #3 - MULTIPLE GRID POINTS

```
                         FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
                     EXAMPLE AIRPORT SCENARIO GRID ANALYSIS

1000  1  0.000        AIRPORT SECTION


                  AIRPORT ALTITUDE=      0. FT ABOVE MSL          AMBIENT TEMP= 15.DEG C

RUNWAY  1    10000.00         0.00         0.00         0.00         0.00         0.00   27  9 T.O. RWY 27          LENGTH = 10000.
RUNWAY  2        0.00         0.00         0.00     10000.00         0.00         0.00    9 27 T.O. RWY  9          LENGTH = 10000.
RUNWAY  3     7000.00     -7000.00         0.00      2000.00      2000.00         0.00   31 13 T.O. RWY 31          LENGTH = 10296.
RUNWAY  4     2000.00      2000.00         0.00      7000.00     -7000.00         0.00   13 31 T.O. RWY 13          LENGTH = 10296.
TRACK DATA  1 1 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  1 2 3    .50  45.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  3 3 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 4 5    .50  90.00  -1.50   1.50   0.00  45.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 5 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 6 3    .50  10.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 7 3    .50  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 8 3   1.00  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 9 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00

1070  0  0.000       AIRCRAFT SELECTION SECTION

THE FOLLOWING AIRCRAFT ARE RETRIEVED AS THEY APPEAR IN THE DATA BASE:
  3  5  8 43
NEW OR REPLACEMENT AIRCRAFT DEFINITIONS:
 AC     NAME                NC APP    T. O. P R O F I L E S
 17   AIRCRAFT X            19 101   27  28  29  30  31  32  32
101   AIRCRAFT Y           101 102 201 201 202 202   0   0   0
102   AIRCRAFT Z            20  18  38  28  39  29   0   0   0

1010  0  0.000       PROFILE SECTION

PROFILE  18 (FEET)                  REPLACEMENT B727-200 T.O. PROFILE
     0.00   5000.00  25000.00  50000.00  75000.00 100000.00 150000.00        0.00   0.00000         0.00
     0.00      0.00   2000.00   4500.00   7000.00   9500.00  14500.00        0.00   0.00000         0.00
    32.00    160.00    160.00    160.00    160.00    160.00    160.00        3.00   0.00000         0.00
 15000.00  15000.00  15000.00  15000.00  15000.00  15000.00      0.00  120000.00   0.00000         0.00
PROFILE 201 (FEET)                 AIRCRAFT Y SHORT RANGE T.O. PROFILE
     0.00   5000.00  25000.00  50000.00  75000.00 100000.00 150000.00        0.00      0.00         0.00
     0.00      0.00   2000.00   4500.00   7000.00   9500.00  14500.00        0.00      0.00         0.00
    32.00    200.00    200.00    200.00    200.00    200.00    200.00        3.00      0.00         0.00
 30000.00  30000.00  30000.00  30000.00  30000.00  30000.00      0.00  300000.00      0.00         0.00
PROFILE 202 (FEET)                 AIRCRAFT Y LONG RANGE T.O. PROFILE
     0.00  10000.00  20000.00  50000.00  70050.00 100000.00 150000.00        0.00      0.00         0.00
     0.00      0.00   2000.00   4000.00   6000.00   9000.00  14000.00        0.00      0.00         0.00
    32.00    250.00    250.00    250.00    250.00    250.00    250.00        3.00      0.00         0.00
 30000.00  30000.00  30000.00  30000.00  30000.00  30000.00      0.00  350000.00      0.00         0.00
PROFILE 301 (N.M.)               STANDARD 3 DEGREE APPROACH
    -1.00      -.17      2.98      5.26     12.40     18.68      0.00      0.00      0.00         0.00
     0.00      0.00   1000.00   3000.00   4000.00   5000.00      0.00      0.00      0.00         0.00
    32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00         0.00
   -10.00     -3.00     -6.00     -6.00     -6.00      0.00      0.00      0.00      0.00         0.00
PROFILE 302 (N.M.)               STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
    -1.00      -.17      2.98      5.26     12.00     15.14      0.00      0.00      0.00         0.00
     0.00      0.00   1000.00   3000.00   3000.00   4000.00      0.00      0.00      0.00         0.00
    32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00      0.00      0.00         0.00
   -10.00     -3.00     -6.00     -5.00     -6.00      0.00      0.00      0.00      0.00         0.00
```

FIGURE A-6. GRID ANALYSIS REPORT FOR CASE #3

```
PROFILE 303 (N.M.)          GA. 3 DEGREE APPROACH
   -1.00     -.17     2.98     5.26    12.40    18.68     0.00     0.00     0.00     0.00
    0.00     0.00  1000.00  3000.00  4000.00  5000.00     0.00     0.00     0.00     0.00
   32.00    -2.00    -2.00    -2.00    -2.00    -2.00     0.00     0.00     0.00     0.00
   -3.00    -3.00    -3.00    -3.00    -3.00     0.00     0.00     0.00     0.00     0.00

1080  0  0.000      ALTERNATIVE APPROACH PARAMETERS SECTION

APPROACH PARAMETERS
                                                   *THRUSTS*
TYPE  AIRCRAFT   LDG ROLL    SPEED     3 DEG L   6 DEG L    LEVEL A   3 DEG A   LEVEL M  500FT/NM     IDLE   REVERSE    WEIGHT  NF
101 ACFT X          5000.     150.     10000.         0.         0.    10000.        0.        0.       0.    15000.   100000.  4.
102 ACFT Y          3000.     180.     15000.      8000.    10000.    12000.     7000.     7500.    4000.    20000.   200000.  3.

1020  0  0.000      ALTERNATIVE NOISE VS DISTANCE SECTION

NOISE CURVE NUMBER 101            TABLES FOR AIRCRAFT Y
                                     VALUES OF EPNL
   THRUST     200 FT    400 FT    600 FT   1000 FT   2000 FT   4000 FT   6000 FT  10000 FT
   30000.0    105.00    100.00     95.00     90.00     85.00     80.00     75.00     70.00
   20000.0    100.00     95.00     90.00     85.00     80.00     75.00     70.00     65.00
   10000.0     95.00     90.00     85.00     80.00     75.00     70.00     65.00     60.00
                                     VALUES OF NEL
   THRUST     200 FT    400 FT    600 FT   1000 FT   2000 FT   4000 FT   6000 FT  10000 FT
   30000.0    100.00     95.00     90.00     85.00     80.00     75.00     70.00     65.00
   20000.0     95.00     90.00     85.00     80.00     75.00     70.00     65.00     60.00
   10000.0     90.00     85.00     80.00     75.00     70.00     65.00     60.00     55.00

1000  3  0.000       AIRCRAFT MIX SECTION


MIX DATA
                  *                 *                 *                 *                 *                 *                 *                 *
  3  7   0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3  8   0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  3.0  1.0  1.0  2.0  0.0  1.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  3  9 301  9.0  4.0  4.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  5  6 302  4.0  3.0  2.0  2.0  1.0  0.0  2.0  1.0  0.0  2.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
  8  3 301 10.0  2.0  5.0  5.0  1.0  3.0  2.0  0.0  1.0  3.0  0.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 17  1 301  5.0  2.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  2.0  0.0  2.0  0.0  0.0  0.0  2.0  0.0  2.0  0.0  0.0  0.0  0.0  0.0  0.0
 43  4   0  0.0  0.0  0.0 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
 43  2 303 25.0  5.0 10.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
101  5 302  8.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  6.0  1.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
102  3 301  4.0  0.0  0.0  2.0  0.0  0.0  1.0  0.0  0.0  1.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
                               FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
                          EXAMPLE AIRPORT SCENARIO GRID ANALYSIS                                                   07/30/79.

 A/C   A/C NAME           NC      ARRIVALS     0- 500    500-1000   1000-1500   1500-2500   2500-3500   3500-4500   4500- UP

  3          BAC-111      2   D     9.0  48    3.0  49    2.0  49     3.0  49     2.0   0     0.0   0     0.0   0     0.0
                              E     4.0        1.0        1.5         1.0         0.0         0.0         0.0         0.0
                              N     4.0        1.0        0.0         1.0         1.5         0.0         0.0         0.0

  5 3E NBTF  727-200      8   D     4.0  18    2.0  20    2.0  20     2.0  20     0.0   0     0.0   0     0.0   0     0.0
                              E     3.0        1.0        1.0         1.0         0.0         0.0         0.0         0.0
                              N     2.0        0.0        0.0         0.0         0.0         0.0         0.0         0.0

  8         707-120B     11   D    10.0  38    5.0  39    2.0  40     3.0  41     1.0  42     0.0  42     0.0  42     0.0
                              E     2.0        1.0        0.0         0.0         0.0         0.0         0.0         0.0
                              N     5.0        3.0        1.0         1.0         0.0         0.0         0.0         0.0

 17  AIRCRAFT X          19   D     5.0  27    0.0  28    0.0  29     2.0  30     0.0  31     2.0  32     0.0  32     0.0
                              E     2.0        0.0        0.0         0.0         0.0         0.0         0.0         0.0
                              N     1.0        0.0        0.0         2.0         0.0         2.0         0.0         0.0
```

FIGURE A-6. GRID ANALYSIS REPORT FOR CASE #3 (CONT)

```
43 MSEPA            26  D   25.0  91  25.0   0   0.0   0   0.0   0   0.0   0   0.0   0   0.0   0   0.0
                        E    5.0       5.0       0.0       0.0       0.0       0.0       0.0       0.0
                        N   10.0      10.0       0.0       0.0       0.0       0.0       0.0       0.0

101  AIRCRAFT Y    101  D    8.0 201   0.0 201   0.0 202   8.0 202   0.0   0   0.0   0   0.0   0   0.0
                        E    1.0       0.0       0.0       1.0       0.0       0.0       0.0       0.0
                        N    1.0       0.0       0.0       1.0       0.0       0.0       0.0       0.0

102  AIRCRAFT 7     20  D    4.0  38   2.0  28   1.0  39   1.0  29   0.0   0   0.0   0   0.0   0   0.0
                        E    0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
                        N    0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0


               FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
           EXAMPLE AIRPORT SCENARIO GRID ANALYSIS

  RUNWAY UTILIZATION

RUNWAYS-        27      9     31     13    TOT

 TAKEOFFS  D    4.0   39.0   15.0   10.0   68.0
 (ACTUAL)  E    0.0    9.0    1.0    3.5   13.5
           N    4.0   11.0    5.0    3.5   23.5

 TAKEOFFS  D    3.8   37.1   14.3    9.5
 (PERCENT) E    0.0    8.6    1.0    3.3
           N    3.8   10.5    4.8    3.3

 LANDINGS  D   12.0   30.0    9.0   14.0   65.0
 (ACTUAL)  E    4.0    7.0    4.0    2.0   17.0
           N    3.0   11.0    4.0    5.0   23.0

 LANDINGS  D   11.4   28.6    8.6   13.3
 (PERCENT) E    3.8    6.7    3.8    1.9
           N    2.9   10.5    3.8    4.8


 TOTAL  TAKEOFFS  105.0  LANDINGS  105.0


TOTAL OPERATIONS - DAILY   210.  - YEARLY   76650.
DEFAULT RUNWAY  2    9

 TOTAL FLIGHTS    23

1030  0  0.000     TAKEOFF PROFILE MODIFICATION SECTION

ALTITUDE RESTRICTION/CUTBACK DATA
C/R OVERRIDE ARRAY:00000000001000000000000000000000000000000000000
RESTRICTION  1  1     0.00000  3000.00000    10.00000  3  0  0  0  0  0  0  0  0  0
RESTRICTION  2  5      .04000     3.00000  8000.00000  7  8  0  0  0  0  0  0  0  0

  00  0  0.000
```

FIGURE A-6. GRID ANALYSIS REPORT FOR CASE #3 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO GRID ANALYSIS

07/30/79.

NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), TAKEOFF PROFILE(S), AND NOISE CURVE(S).
NO TIME ABOVE VALUES CALCULATED (DIRECTIVITY DATA NOT AVAILABLE FOR NEW AIRCRAFT TYPES)

INTER-SECTION	OFF SET	PERIOD	TIME IN MINUTES ABOVE INDICATED DBA LEVEL 65	75	85	95	105	115	LEQ	LDN	NEF	CNEL
0. B	.0..0	24 HOUR EVENING NIGHT							77.4	83.5	46.6	83.7
1. B	.0..0	24 HOUR EVENING NIGHT							77.6	83.8	47.4	83.9
0. C	.0..0	24 HOUR EVENING NIGHT							72.3	77.7	42.2	77.9
1. C	.0..0	24 HOUR EVENING NIGHT							74.9	79.5	45.6	79.7
0. D	.0..0	24 HOUR EVENING NIGHT							71.0	75.2	41.7	75.4
1. D	.0..0	24 HOUR EVENING NIGHT							75.2	79.0	47.8	79.2
0. E	.0..0	24 HOUR EVENING NIGHT							71.3	74.9	43.1	75.0
1. E	.0..0	24 HOUR EVENING NIGHT							77.5	81.7	51.4	82.0
0. F	.0..0	24 HOUR EVENING NIGHT							73.6	77.6	47.3	77.8
1. F	.0..0	24 HOUR EVENING NIGHT							71.5	74.9	44.1	75.1

X-START	Y-START	X-STEP	Y-STEP	NX	NY	OPTIONS
0.00	1000.00	1000.	1000.	2	5	00000

FIGURE A-6. GRID ANALYSIS REPORT FOR CASE #3 (CONT)

```
EXAMPLE AIRPORT SCENARIO GRID ANALYSIS WITHOUT AIRCRAFT 101
100    1           AIRPORT SECTION
       0.        15.0
  1    10000.        0.                  0.         0.            27  9 T.O. RWY 27
  2        0.        0.              10000.         0.             9 27 T.O. RWY  9
  3     7000.    -7000.               2000.      2000.            31 13 T.O. RWY 31
  4     2000.     2000.               7000.     -7000.            13 31 T.O. RWY 13

 1 1 1  50.
 1 2 3   .5  45.  1.5  50.
 3 3 1  50.
 2 4 5   .5  90. -1.5  1.5   0.  45. -1.5  50.
 2 5 1  50.
 2 6 3   .5  10.  1.5  50.
 4 7 3   .5  30. -1.5  50.
 4 8 3  1.0  30. -1.5  50.
 4 9 1  50.

107               AIRCRAFT SELECTION SECTION
 3. 5. 8.43
 17 AIRCRAFT X             19101 27 28 29 30 31 32 32
102 AIRCRAFT Z             20 18 38 28 39 29

101               PROFILE SECTION
 18  1             REPLACEMENT B727-200 T.O. PROFILE
0.       5000.   25000.  50000.  75000.  100000. 150000.
0.       0.      2000.   4500.   7000.   9500.   14500.
32.      160.    160.    160.    160.    160.    160.     3.
15000.  15000.  15000.  15000.  15000.  15000.           120000.
301              STANDARD 3 DEGREE APPROACH
   -1.0    -.165   2.975   9.255  12.395  18.675
    0.0     0.0    1000.   3000.   4000.   5000.
    32.     -2.     -2.     -2.     -2.     -2.
   -10.     -3.     -6.     -6.     -6.
302              STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
   -1.0    -.165   2.975   9.255    12.    15.14
    0.0     0.0    1000.   3000.   3000.   4000.
    32.     -2.     -2.     -2.     -2.     -2.
   -10.     -3.     -6.     -5.     -6.
303              GA. 3 DEGREE APPROACH
   -1.0    -.165   2.975   9.255  12.395  18.675
    0.0     0.0    1000.   3000.   4000.   5000.
    32.     -2.     -2.     -2.     -2.     -2.
    -3.     -3.     -3.     -3.     -3.
108                ALTERNATIVE APPROACH PARAMETERS SECTION
101
ACFT X       100000.   4.
5000.   150.    10000.                    10000.                            15000.
100    3            AIRCRAFT MIX SECTION
  3 7                3. 1. 1. 2.1.5
  3 8                                 3. 1. 1. 2.   1.5
  3 9301 9. 4. 4.
  5 6302 4. 3. 2. 2. 1.    2. 1.    2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.    1. 3.    1. 1.
 17 1301 5. 2. 1.                     2.    2.          2.    2.
 43 4               25. 5.10.
 43 230325. 5.10.
102 3301 4.        2.        1.        1.
103                TAKEOFF PROFILE MODIFICATION SECTION
         1
  1  1              3000.      10.    3
  2  5      .04        3.   8000.     7    8
GRID             0.         1000.      1000.      1000.          2    5
END
```

FIGURE A-7. INPUT CASE #4 - MULTIPLE GRID POINTS

```
                         FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
                    EXAMPLE AIRPORT SCENARIO GRID ANALYSIS WITHOUT AIRCRAFT 101

1000  1  0.000        AIRPORT SECTION


                   AIRPORT ALTITUDE=      0. FT ABOVE MSL          AMBIENT TEMP= 15.DEG C

RUNWAY  1    10000.00        0.00        0.00        0.00        0.00        0.00  27  9 T.O. RWY 27          LENGTH = 10000.
RUNWAY  2        0.00        0.00        0.00    10000.00        0.00        0.00   9 27 T.O. RWY  9          LENGTH = 10000.
RUNWAY  3     7000.00    -7000.00        0.00     2000.00     2000.00        0.00  31 13 T.O. RWY 31          LENGTH = 10296.
RUNWAY  4     2000.00     2000.00        0.00     7000.00    -7000.00        0.00  13 31 T.O. RWY 13          LENGTH = 10296.
TRACK DATA  1 1 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  1 2 3    .50  45.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  3 3 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 4 5    .50  90.00  -1.50   1.50   0.00  45.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 5 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 6 3    .50  10.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 7 3    .50  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 8 3   1.00  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 9 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00

1070  0  0.000      AIRCRAFT SELECTION SECTION

THE FOLLOWING AIRCRAFT ARE RETRIEVED AS THEY APPEAR IN THE DATA BASE:
   3  5  8 43
NEW OR REPLACEMENT AIRCRAFT DEFINITIONS:
 AC    NAME                  NC APP    T. O.  P R O F I L E S
 17   AIRCRAFT X             19 101   27  28  29  30  31  32  32
102   AIRCRAFT Z             20  18   38  28  39  29   0   0   0

1010  0  0.000      PROFILE SECTION

PROFILE  18 (FEET)                REPLACEMENT B727-200 T.O. PROFILE
      0.00    5000.00  25000.00  50000.00  75000.00 100000.00 150000.00        0.00   0.00000        0.00
      0.00       0.00   2000.00   4500.00   7000.00   9500.00  14500.00        0.00   0.00000        0.00
     32.00     160.00    160.00    160.00    160.00    160.00    160.00        3.00   0.00000        0.00
  15000.00   15000.00  15000.00  15000.00  15000.00  15000.00      0.00   120000.00   0.00000        0.00
PROFILE 301 (N.M.)                STANDARD 3 DEGREE APPROACH
     -1.00       -.17      2.98      9.26     12.40     18.68      0.00        0.00      0.00        0.00
      0.00       0.00   1000.00   3000.00   4000.00   5000.00      0.00        0.00      0.00        0.00
     32.00      -2.00     -2.00     -2.00     -2.00     -2.00      0.00        0.00      0.00        0.00
    -10.00      -3.00     -6.00     -6.00     -6.00      0.00      0.00        0.00      0.00        0.00
PROFILE 302 (N.M.)                STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
     -1.00       -.17      2.98      9.26     12.00     15.14      0.00        0.00      0.00        0.00
      0.00       0.00   1000.00   3000.00   3000.00   4000.00      0.00        0.00      0.00        0.00
     32.00      -2.00     -2.00     -2.00     -2.00     -2.00      0.00        0.00      0.00        0.00
    -10.00      -3.00     -6.00     -5.00     -6.00      0.00      0.00        0.00      0.00        0.00
PROFILE 303 (N.M.)                GA. 3 DEGREE APPROACH
     -1.00       -.17      2.98      9.26     12.40     18.68      0.00        0.00      0.00        0.00
      0.00       0.00   1000.00   3000.00   4000.00   5000.00      0.00        0.00      0.00        0.00
     32.00      -2.00     -2.00     -2.00     -2.00     -2.00      0.00        0.00      0.00        0.00
     -3.00      -3.00     -3.00     -3.00     -3.00      0.00      0.00        0.00      0.00        0.00

1080  0  0.000      ALTERNATIVE APPROACH PARAMETERS SECTION

APPROACH PARAMETERS
                                                    *THRUSTS*
TYPE  AIRCRAFT   LDG ROLL   SPEED    3 DEG L   6 DEG L   LEVEL A   3 DEG A   LEVEL M  500FT/NM    IDLE   REVERSE    WEIGHT  NE
101 ACFT X          5000.    150.    10000.       0.         0.    10000.       0.        0.        0.   15000.   100000.  4.

1000  3  0.000      AIRCRAFT MIX SECTION
```

FIGURE A-8. GRID ANALYSIS REPORT FOR CASE #4

MIX DATA

3	7	0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	9	301	9.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	6	302	4.0	1.0	2.0	2.0	1.0	0.0	2.0	1.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	3	301	10.0	2.0	5.0	5.0	1.0	3.0	2.0	0.0	1.0	3.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	1	301	5.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
43	4	0	0.0	0.0	0.0	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	2	303	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102	3	301	4.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6

EXAMPLE AIRPORT SCENARIO GRID ANALYSIS W/O AIRCRAFT 101 07/30/79.

A/C	A/C NAME		NC		ARRIVALS		0- 500		500-1000		1000-1500		1500-2500		2500-3500		3500-4500		4500- UP
3		BAC-111	2	D	9.0	48	3.0	49	2.0	49	3.0	49	2.0	0	0.0	0	0.0	0	0.0
				E	4.0		1.0		1.5		1.0		0.0		0.0		0.0		0.0
				N	4.0		1.0		0.0		1.0		1.5		0.0		0.0		0.0
5	3E N8TF	727-200	8	D	4.0	18	2.0	20	2.0	20	2.0	20	0.0	0	0.0	0	0.0	0	0.0
				E	3.0		1.0		1.0		1.0		0.0		0.0		0.0		0.0
				N	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
8		707-120B	11	D	10.0	38	5.0	39	2.0	40	3.0	41	1.0	42	0.0	42	0.0	42	0.0
				E	2.0		1.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	5.0		3.0		1.0		1.0		0.0		0.0		0.0		0.0
17	AIRCRAFT X		19	D	5.0	27	0.0	28	0.0	29	2.0	30	0.0	31	2.0	32	0.0	32	0.0
				E	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	1.0		0.0		0.0		2.0		0.0		2.0		0.0		0.0
43	MSEP6		26	D	25.0	91	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
				E	5.0		5.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	10.0		10.0		0.0		0.0		0.0		0.0		0.0		0.0
102	AIRCRAFT 7		20	D	4.0	38	2.0	28	1.0	39	1.0	29	0.0	0	0.0	0	0.0	0	0.0
				E	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

FIGURE A-8. GRID ANALYSIS REPORT FOR CASE #4 (CONT)

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                    FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
               EXAMPLE AIRPORT SCENARIO GRID ANALYSIS WITHOUT AIRCRAFT 101

 RUNWAY UTILIZATION

RUNWAYS-       27      9      31     13     TOT

 TAKEOFFS  D    4.0   31.0   15.0   10.0   60.0
 (ACTUAL)  E    0.0    8.0    1.0    3.5   12.5
           N    4.0   10.0    5.0    3.5   22.5

 TAKEOFFS  D    4.2   32.6   15.8   10.5
 (PERCENT) E    0.0    8.4    1.1    3.7
           N    4.2   10.5    5.3    3.7

 LANDINGS  D    4.0   30.0    9.0   14.0   57.0
 (ACTUAL)  E    3.0    7.0    4.0    2.0   16.0
           N    2.0   11.0    4.0    5.0   22.0

 LANDINGS  D    4.2   31.6    9.5   14.7
 (PERCENT) E    3.2    7.4    4.2    2.1
           N    2.1   11.6    4.2    5.3

 TOTAL  TAKEOFFS   95.0  LANDINGS   95.0

TOTAL OPERATIONS - DAILY   190.  - YEARLY   69350.
DEFAULT RUNWAY  2    9

 TOTAL FLIGHTS     21

1030  0  0.000      TAKEOFF PROFILE MODIFICATION SECTION

ALTITUDE RESTRICTION/CUTBACK DATA
C/B OVERRIDE ARRAY:0000000000100000000000000000000000000000000
RESTRICTION   1   1      0.00000  3000.00000    10.00000   3  0  0  0  0  0  0  0  0  0
RESTRICTION   2   5       .04000     3.00000  8000.00000   7  8  0  0  0  0  0  0  0  0

  00  0  0.000
```

FIGURE A-8. GRID ANALYSIS REPORT FOR CASE #4 (CONT)

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO GRID ANALYSIS WITHOUT AIRCRAFT 101

07/30/79.

NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), AND TAKEOFF PROFILE(S).

INTER-SECTION	OFF SET	PERIOD	TIME IN MINUTES ABOVE INDICATED DBA LEVEL 65	75	85	95	105	115	LEQ	LDN	NEF	CNEL
0. B	.0..0	24 HOUR	74.8	31.0	12.0	2.7	.1	0.0	77.4	83.5	46.6	83.6
		EVENING	9.4	4.1	1.6	.2	0.0	0.0				
		NIGHT	17.1	6.8	2.7	1.0	.0	0.0				
1. B	.0..0	24 HOUR	81.2	37.5	16.7	3.7	.2	0.0	77.6	83.8	47.4	83.9
		EVENING	10.3	5.1	2.1	.2	0.0	0.0				
		NIGHT	18.7	8.1	3.9	1.1	.1	0.0				
0. C	.0..0	24 HOUR	60.7	34.1	9.8	1.7	0.0	0.0	72.3	77.7	42.2	77.9
		EVENING	7.8	4.6	.6	0.0	0.0	0.0				
		NIGHT	13.8	7.4	2.8	.7	0.0	0.0				
1. C	.0..0	24 HOUR	58.5	35.7	16.3	2.4	0.0	0.0	74.9	79.5	45.6	79.7
		EVENING	7.4	4.7	1.5	0.0	0.0	0.0				
		NIGHT	13.2	8.0	4.4	.7	0.0	0.0				
0. D	.0..0	24 HOUR	59.5	32.0	9.2	.3	0.0	0.0	71.0	75.2	41.7	75.4
		EVENING	7.6	3.8	.2	0.0	0.0	0.0				
		NIGHT	13.7	7.2	2.9	0.0	0.0	0.0				
1. D	.0..0	24 HOUR	56.0	30.4	11.6	2.2	0.0	0.0	75.2	79.0	47.8	79.2
		EVENING	7.1	3.5	.4	.1	0.0	0.0				
		NIGHT	12.8	7.0	3.6	.4	0.0	0.0				
0. E	.0..0	24 HOUR	55.7	27.1	9.8	.3	0.0	0.0	71.3	74.9	43.1	75.0
		EVENING	6.7	2.4	.3	.0	0.0	0.0				
		NIGHT	13.1	6.8	2.8	.0	0.0	0.0				
1. E	.0..0	24 HOUR	51.8	26.1	10.6	2.0	.4	0.0	77.5	81.7	51.4	82.0
		EVENING	6.2	2.3	.4	.1	.0	0.0				
		NIGHT	12.0	6.7	3.1	.4	.1	0.0				
0. F	.0..0	24 HOUR	49.4	24.5	8.5	1.4	0.0	0.0	73.6	77.6	47.3	77.8
		EVENING	5.4	1.8	.3	.1	0.0	0.0				
		NIGHT	12.0	6.5	2.2	.3	0.0	0.0				
1. F	.0..0	24 HOUR	51.5	23.4	8.8	.9	0.0	0.0	71.5	74.9	44.1	75.1
		EVENING	5.8	1.5	.3	.1	0.0	0.0				
		NIGHT	12.4	6.3	2.3	.2	0.0	0.0				

X-START	Y-START	X-STEP	Y-STEP	NX	NY	OPTIONS
0.00	1000.00	1000.	1000.	2	5	00000

FIGURE A-8. GRID ANALYSIS REPORT FOR CASE #4 (CONT)

```
EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101
100   1              AIRPORT SECTION
       0.       15.0
  1  10000.        0.                   0.        0.            27  9 T.O. RWY 27
  2      0.        0.               10000.        0.             9 27 T.O. RWY  9
  3   7000.    -7000.                2000.     2000.            31 13 T.O. RWY 31
  4   2000.     2000.                7000.    -7000.            13 31 T.O. RWY 13

 1 1 1  50.
 1 2 3   .5  45.  1.5  50.
 3 3 1  50.
 2 4 5   .5  90. -1.5  1.5   0.  45. -1.5  50.
 2 5 1  50.
 2 6 3   .5  10.  1.5  50.
 4 7 3   .5  30. -1.5  50.
 4 8 3  1.0  30. -1.5  50.
 4 9 1  50.

107                AIRCRAFT SELECTION SECTION
 3. 5. 8.43
 17 AIRCRAFT X              19101 27 28 29 30 31 32 32
102 AIRCRAFT 7              20 18 38 28 39 29

101                PROFILE SECTION
 18  1               REPLACEMENT B727-200 T.O. PROFILE
0.       5000.   25000.  50000.  75000.  100000. 150000.
0.       0.      2000.   4500.   7000.   9500.   14500.
32.      160.    160.    160.    160.    160.    160.     3.
15000.  15000.  15000.  15000.  15000.  15000.           120000.
301             STANDARD 3 DEGREE APPROACH
    -1.0    -.165   2.975   9.255  12.395  18.675
     0.0     0.0   1000.   3000.   4000.   5000.
     32.     -2.     -2.     -2.     -2.     -2.
    -10.     -3.     -6.     -6.     -6.
302             STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
    -1.0    -.165   2.975   9.255     12.   15.14
     0.0     0.0   1000.   3000.   3000.   4000.
     32.     -2.     -2.     -2.     -2.     -2.
    -10.     -3.     -6.     -5.     -6.
303             GA. 3 DEGREE APPROACH
    -1.0    -.165   2.975   9.255  12.395  18.675
     0.0     0.0   1000.   3000.   4000.   5000.
     32.     -2.     -2.     -2.     -2.     -2.
     -3.     -3.     -3.     -3.     -3.
108                ALTERNATIVE APPROACH PARAMETERS SECTION
101
ACFT X       100000.   4.
5000.   150.   10000.                  10000.                              15000.
100    3             AIRCRAFT MIX SECTION
  3 7                 3. 1. 1. 2.1.5
  3 8                                   3. 1. 1. 2.   1.5
  3 9301 9. 4. 4.
  5 6302 4. 3. 2. 2. 1.    2. 1.    2. 1.
  8 330110. 2. 5. 5. 1. 3. 2.    1. 3.    1. 1.
 17 1301 5. 2. 1.                       2.    2.             2.    2.
 43 4               25. 5.10.
 43 230325. 5.10.
102 3301 4.        2.         1.        1.

103                TAKEOFF PROFILE MODIFICATION SECTION
           1
  1  1            3000.      10.     3
  2  5      .04       3.   8000.     7     8
GRID             0.         1000.      1000.      1000.           1    134
END
```

FIGURE A-9. INPUT CASE #5 - DETAIL GRID OUTPUT OPTIONS FOR SINGLE POINT

```
                              FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
                 EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101                    07/30/79.

1000  1  0.000       AIRPORT SECTION


                     AIRPORT ALTITUDE=     0. FT ABOVE MSL          AMBIENT TEMP= 15.DEG C

RUNWAY  1    10000.00       0.00       0.00       0.00       0.00       0.00   27  9 T.O. RWY 27         LENGTH = 10000.
RUNWAY  2        0.00       0.00       0.00   10000.00       0.00       0.00    9 27 T.O. RWY  9         LENGTH = 10000.
RUNWAY  3     7000.00   -7000.00       0.00    2000.00    2000.00       0.00   31 13 T.O. RWY 31         LENGTH = 10296.
RUNWAY  4     2000.00    2000.00       0.00    7000.00   -7000.00       0.00   13 31 T.O. RWY 13         LENGTH = 10296.
TRACK DATA  1 1 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  1 2 3    .50  45.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  3 3 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 4 5    .50  90.00  -1.50   1.50   0.00  45.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 5 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  2 6 3    .50  10.00   1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 7 3    .50  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 8 3   1.00  30.00  -1.50  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
TRACK DATA  4 9 1  50.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00

1070  0  0.000      AIRCRAFT SELECTION SECTION

THE FOLLOWING AIRCRAFT ARE RETRIEVED AS THEY APPEAR IN THE DATA BASE:
  3  5  8 43
NEW OR REPLACEMENT AIRCRAFT DEFINITIONS:
 AC      NAME                 NC APP    T. O. P R O F I L E S
 17   AIRCRAFT X              19 101   27   28   29   30   31   32   32
102   AIRCRAFT Z              20  18   38   28   39   29    0    0    0

1010  0  0.000      PROFILE SECTION

PROFILE  18 (FEET)               REPLACEMENT B727-200 T.O. PROFILE
      0.00   5000.00  25000.00  50000.00  75000.00 100000.00 150000.00       0.00   0.00000      0.00
      0.00      0.00   2000.00   4500.00   7000.00   9500.00  14500.00       0.00   0.00000      0.00
     32.00    160.00    160.00    160.00    160.00    160.00    160.00       3.00   0.00000      0.00
  15000.00  15000.00  15000.00  15000.00  15000.00  15000.00      0.00 120000.00   0.00000      0.00
PROFILE 301 (N.M.)           STANDARD 3 DEGREE APPROACH
     -1.00      -.17      2.98      9.26     12.40     18.68      0.00       0.00      0.00      0.00
      0.00      0.00   1000.00   3000.00   4000.00   5000.00      0.00       0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00       0.00      0.00      0.00
    -10.00     -3.00     -6.00     -6.00     -6.00      0.00      0.00       0.00      0.00      0.00
PROFILE 302 (N.M.)           STANDARD 3 DEGREE APPROACH WITH LEV. SEGMENT
     -1.00      -.17      2.98      9.26     12.00     15.14      0.00       0.00      0.00      0.00
      0.00      0.00   1000.00   3000.00   3000.00   4000.00      0.00       0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00       0.00      0.00      0.00
    -10.00     -3.00     -6.00     -5.00     -6.00      0.00      0.00       0.00      0.00      0.00
PROFILE 303 (N.M.)           GA. 3 DEGREE APPROACH
     -1.00      -.17      2.98      9.26     12.40     18.68      0.00       0.00      0.00      0.00
      0.00      0.00   1000.00   3000.00   4000.00   5000.00      0.00       0.00      0.00      0.00
     32.00     -2.00     -2.00     -2.00     -2.00     -2.00      0.00       0.00      0.00      0.00
     -3.00     -3.00     -3.00     -3.00     -3.00      0.00      0.00       0.00      0.00      0.00

1080  0  0.000      ALTERNATIVE APPROACH PARAMETERS SECTION

APPROACH PARAMETERS
                                                   *THRUSTS*
TYPE  AIRCRAFT    LDG ROLL    SPEED    3 DEG L   6 DEG L   LEVEL A   3 DEG A   LEVEL M   500FT/NM    IDLE   REVERSE    WEIGHT  NE
101 ACFT X           5000.     150.     10000.       0.        0.     10000.       0.        0.        0.    15000.   100000.  4.
```

FIGURE A-10. GRID ANALYSIS REPORT FOR CASE #5

1000 3 0.000 AIRCRAFT MIX SECTION

MIX DATA

3	7	0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	8	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	1.0	1.0	2.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	9	301	9.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	6	302	4.0	3.0	2.0	2.0	1.0	0.0	2.0	1.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	3	301	10.0	2.0	5.0	5.0	1.0	3.0	2.0	0.0	1.0	3.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	1	301	5.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
43	4	0	0.0	0.0	0.0	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
43	2	303	25.0	5.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
102	3	301	4.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101 07/30/79.

A/C	A/C NAME		NC		ARRIVALS		0- 500		500-1000		1000-1500		1500-2500		2500-3500		3500-4500		4500- UP
3		BAC-111	2	D	9.0	48	3.0	49	2.0	49	3.0	49	2.0	0	0.0	0	0.0	0	0.0
				E	4.0		1.0		1.5		1.0		0.0		0.0		0.0		0.0
				N	4.0		1.0		0.0		1.0		1.5		0.0		0.0		0.0
5	3E NBTF	727-200	8	D	4.0	18	2.0	20	2.0	20	2.0	20	0.0	0	0.0	0	0.0	0	0.0
				E	3.0		1.0		1.0		1.0		0.0		0.0		0.0		0.0
				N	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
8		707-120B	11	D	10.0	38	5.0	39	2.0	40	3.0	41	1.0	42	0.0	42	0.0	42	0.0
				E	2.0		1.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	5.0		3.0		1.0		1.0		0.0		0.0		0.0		0.0
17	AIRCRAFT X		19	D	5.0	27	0.0	28	0.0	29	2.0	30	0.0	31	2.0	32	0.0	32	0.0
				E	2.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	1.0		0.0		0.0		2.0		0.0		2.0		0.0		0.0
43	MSEP6		26	D	25.0	91	25.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
				E	5.0		5.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	10.0		10.0		0.0		0.0		0.0		0.0		0.0		0.0
102	AIRCRAFT 7		20	D	4.0	38	2.0	28	1.0	39	1.0	29	0.0	0	0.0	0	0.0	0	0.0
				E	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0
				N	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0

FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101 07/30/79.

RUNWAY UTILIZATION

RUNWAYS-		27	9	31	13	TOT
TAKEOFFS (ACTUAL)	D	4.0	31.0	15.0	10.0	60.0
	E	0.0	8.0	1.0	3.5	12.5
	N	4.0	10.0	5.0	3.5	22.5
TAKEOFFS (PERCENT)	D	4.2	32.6	15.9	10.5	
	E	0.0	8.4	1.1	3.7	
	N	4.2	10.5	5.3	3.7	
LANDINGS (ACTUAL)	D	4.0	30.0	9.0	14.0	57.0
	E	3.0	7.0	4.0	2.0	16.0
	N	2.0	11.0	4.0	5.0	22.0

FIGURE A-10. GRID ANALYSIS REPORT FOR CASE #5 (CONT)

```
LANDINGS  D    4.2   11.6    9.5   14.7
(PERCENT) E    3.2    7.4    4.2    2.1
          N    2.1   11.6    4.2    5.3

TOTAL  TAKEOFFS   95.0  LANDINGS   95.0

TOTAL OPERATIONS - DAILY   190.  - YEARLY   69350.
DEFAULT RUNWAY  2    5

TOTAL FLIGHTS   21

1030  0  0.000      TAKEOFF PROFILE MODIFICATION SECTION

ALTITUDE RESTRICTION/CUTBACK DATA
C/B OVERRIDE ARRAY:00000000001000000000000000000000000000000000
RESTRICTION  1  1     0.00000  3000.00000    10.00000  3  0  0  0  0  0  0  0  0  0
RESTRICTION  2  5      .04000     3.00000  8000.00000  7  8  0  0  0  0  0  0  0  0

  00  0  0.000


                 FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
        EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101              07/30/79.
NOTE- THE USER HAS PROVIDED HIS OWN AIRCRAFT DEFINITION(S), APPROACH PARAMETER(S), AND TAKEOFF PROFILE(S).
-----------------------------------------------------------------------------------------------------------------------
I INTER-  I  OFF  I                TIME IN MINUTES ABOVE INDICATED DBA LEVEL                 I       I       I       I        I
I SECTION I  SET  I  PERIOD I   65   I   75   I   85   I   95   I  105   I  115   I  LEQ  I  LDN  I  NEF  I  CNEL  I
-----------------------------------------------------------------------------------------------------------------------
I   0.  0 I  .0.,0 I 24 HOUR I  74.8 I  31.0 I  12.0 I   2.7 I    .1 I   0.0 I  77.4 I  83.5 I  46.6 I  83.6  I
I         I        I EVENING I   5.4 I   4.1 I   1.6 I    .2 I   0.0 I   0.0 I       I       I       I        I
I         I        I  NIGHT  I  17.1 I   6.8 I   2.7 I   1.0 I    .0 I   0.0 I       I       I       I        I
-----------------------------------------------------------------------------------------------------------------------
                         X-START    Y-START    X-STEP  Y-STEP  NX  NY  OPTIONS
                           0.00     1000.00    1000.    1000.   1   1  34000


                 FEDERAL AVIATION ADMINISTRATION INTEGRATED NOISE MODEL 2. 6
        EXAMPLE AIRPORT SCENARIO DETAILED SINGLE-POINT GRID ANALYSIS W/O AIRCRAFT 101              07/30/79.
POINT, X=.0                Y=.100000000E+04
FLT  G  TR PRF NC MAXSEG   D TO TRK       D ALONG TRK  (2ND.)        GRND ATTN ALTITUDE     THRUST      VELOCITY
  1  0  9 301  2   1  0   .7064832E+040.               0.            -.6010E+010.          .800000E+04 .32000E+02
 3.73, 3.73  45.00,45.00   45.61,45.61   40.06,40.06   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  2  0  4  49  2   1  0   .2236068E+040.               0.            -.4720E+010.          .122000E+05 .32000E+02
25.81,25.83  62.76,62.64   63.04,63.11   57.14,57.23   5.4,  5.44   2.8,  2.82   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  3  0  7  49  2   1  0   .2236068E+040.               0.            -.4720E+010.          .122000E+05 .32000E+02
14.46,26.14  53.29,63.29   55.98,63.88   53.29,58.70   2.2,  7.68   1.2,  3.98   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  4  0  7  48  2   1  0   .2236068E+040.               0.            -.4720E+010.          .122000E+05 .32000E+02
22.18,27.50  59.31,64.75   59.89,65.34   54.84,60.20   3.1, 10.82   1.6,  5.57   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  5  0  6 302  8   1  0   .6325545E+040.               0.            -.6010E+010.          .800000E+04 .32000E+02
 9.34,27.67  42.22,64.78   43.09,65.37   37.45,60.22   0.0, 10.82   0.0,  5.57   0.0,  0.00   0.0,  0.00   0.0,  0.00   0.0,  0.00
  6  0  6  20  8   1  0   .1000000E+040.               0.            -.2010E+010.          .123000E+05 .32000E+02
28.71,31.23  64.66,68.83   68.87,70.48   66.66,67.55   4.0, 14.84   2.8,  8.38   1.8,  1.85   0.0,  0.00   0.0,  0.00   0.0,  0.00
  7  0  6  14  8   1  0   .1000000E+040.               0.            -.2010E+010.          .150000E+05 .32000E+02
30.60,33.44  69.46,72.17   71.68,74.13   69.46,71.62   2.7, 17.50   1.5,  9.92   1.1,  2.91    .5,   .53   0.0,  0.00   0.0,  0.00
  8  0  4  41 26   1  0   .1000000E+040.               0.            -.2010E+010.          .121350E+04 .32000E+02
20.63,3-.1-  53.93,72.63   54.25,74.17   48.81,71.64   8.4, 25.92   0.0,  9.92   0.0,  2.91   0.0,   .53   0.0,  0.00   0.0,  0.00
  9  0  3 3.1 20   1  0   .2233957E+04 .1039276E+050.            -.1037E+02 .576386E+02 .440925E+04 .14600E+03
-.83,3-.1-  34.85,72.63   36.85,74.17   36.85,71.64   2.5, 28.39   0.0,  9.92   0.0,  2.91   0.0,   .53   0.0,  0.00   0.0,  0.00
 10  0  3 3.1 11   1  0   .2233957E+04 .1039276E+050.            -.1003E+02 .576386E+02 .389316E+04 .13500E+03
17.35,3-.23  -7.75,72.65   48.02,74.19   42.13,71.65   3.4, 31.82   0.0,  9.92   0.0,  2.91   0.0,   .53   0.0,  0.00   0.0,  0.00
```

FIGURE A-10. GRID ANALYSIS REPORT FOR CASE #5 (CONT)

```
 11  0  3  41 11   1  0  .2233957E+04 .1039276E+050.              -.1871E+01 .492555E+03 .138100E+05 .17000E+03
14.95,34.28  45.34,72.26  45.34,74.15  45.34,71.66   .7, 32.54    .5, 10.38    .1,  2.97   0.0,   .53   0.0,  0.00   0.0,  0.00
 12  0  3  40 11   1  0  .2233957E+04 .1039276E+050.              -.1470E+01 .747911E+03 .139000E+05 .16600E+03
28.04,35.20  56.64,72.37  56.64,74.27  51.52,71.70  2.7, 35.22   1.9, 12.27    .3,  3.23   0.0,   .53   0.0,  0.00   0.0,  0.00
 13  0  3  39 20   1  0  .2233957E+04 .1039276E+050.              -.1252E+01 .894499E+03 .140000E+05 .16300E+03
19.51,35.32  56.91,72.50  56.91,74.35  56.91,71.84  1.3, 36.56    .7, 13.01    .4,  3.58   0.0,   .53   0.0,  0.00   0.0,  0.00
 14  0  3  39 11   1  0  .2233957E+04 .1039276E+050.              -.1252E+01 .894499E+03 .140000E+05 .16300E+03
27.88,36.04  56.37,72.60  56.37,74.41  50.35,71.87  2.1, 38.70   1.3, 14.29    .2,  3.78   0.0,   .53   0.0,  0.00   0.0,  0.00
 15  0  3  38 20   1  0  .2233957E+04 .1039276E+050.              -.8617E+00 .110890E+04 .141000E+05 .15500E+03
22.68,36.24  60.08,72.24  60.08,74.57  60.08,72.15  2.4, 41.14   1.7, 15.94    .7,  4.50   0.0,   .53   0.0,  0.00   0.0,  0.00
 16  0  3  38 11   1  0  .2233957E+04 .1039276E+050.              -.8617E+00 .110890E+04 .141000E+05 .15500E+03
32.72,37.83  61.23,73.13  61.46,74.78  55.21,72.24  7.2, 48.32   3.4, 19.37    .6,  5.07   0.0,   .53   0.0,  0.00   0.0,  0.00
 17  0  3  28 20   1  0  .2233957E+04 .1039276E+050.              -.1005E+01 .894499E+03 .152000E+05 .15400E+03
21.79,37.94  59.19,73.30  59.19,74.90  59.19,72.45  1.5, 49.87    .9, 20.23    .4,  5.51    .1,   .66   0.0,  0.00   0.0,  0.00
 18  0  2 303 26   1  0  .1000000E+04 .1000000E+050.              -.4060E+01 .525478E+02 .486320E+03 .80000E+02
11.88,37.95  45.18,73.31  45.50,74.90  40.06,72.45  6.5, 56.39   0.0, 20.23   0.0,  5.51   0.0,   .66   0.0,  0.00   0.0,  0.00
 19  0  1 301 19   1  0  .1000000E+04 .1000000E+050.              -.6790E+01 .525478E+02 .100192E+05 .15000E+03
26.88,38.28  64.93,73.50  65.85,75.41  61.66,72.80  7.6, 63.99   4.6, 24.87   2.4,  7.86   0.0,   .66   0.0,  0.00   0.0,  0.00
 20  0  1  31 19   1  0  .1000000E+04 .1000000E+050.              -.1189E+01 .433333E+03 .152000E+05 .16300E+03
43.07,44.32  80.16,81.08  80.16,81.41  72.75,75.79  5.3, 69.24   3.1, 28.00   2.0,  9.88   1.0,  1.66    .1,   .09   0.0,  0.00
 21  0  1  29 19   1  0  .1000000E+04 .1000000E+050.              -.7178E+00 .660897E+03 .152000E+05 .15800E+03
42.67,46.58  79.70,83.45  79.70,83.65  72.29,77.39  5.6, 74.81   3.0, 31.02   2.2, 12.03   1.1,  2.71   0.0,   .09   0.0,  0.00
```

CONTRIBUTION OF AIRCRAFT WITH ASSIGNED NOISE CURVES AT POINT X= 0.00, Y= 1000.00

NOISE CURVE ASSIGNMENTS

METRIC	2	8	11	19	20	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NEF	27.6	32.8	35.1	45.9	26.3	21.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LDN	64.8	71.3	63.6	83.0	63.7	54.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CNFL	65.3	73.5	63.8	83.0	63.7	54.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LEQ	60.2	71.3	58.0	75.7	63.7	49.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T(X1) 24H	11.	7.	16.	18.	8.	15.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X1) E	2.	2.	1.	2.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X1) N	2.	0.	5.	6.	0.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) 24H	6.	4.	7.	11.	3.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) E	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X2) N	1.	0.	2.	4.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) 24H	0.	3.	1.	7.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) E	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X3) N	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) 24H	0.	1.	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X4) N	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) 24H	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X5) N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) 24H	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) E	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
T(X6) N	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

FIGURE A-10. GRID ANALYSIS REPORT FOR CASE #5 (CONT)

APPENDIX B

COMPLETE INPUT MODULE EXAMPLE CASE LISTING

This appendix contains the terminal session involving creation of the Example 2 data file. Input by the user is underlined.

This listing does not show how to recover from errors.

```
.EX @AIRPRT
LINK:   Loading
[LNKXCT BEGIN Execution]

FAA INTEGRATED NOISE MODEL INPUT MODULE
        CREATE
        EDIT
        CONTROL OUTPUT
        END
ENTER THE ACTION YOU WISH TO PERFORM:
CREATE
DATA FILE NAME: EXAMPL.DAT

WHAT IS THE AIRPORTS ALTITUDE IN FEET ABOVE SEA LEVEL?
0
WHAT IS THE AVERAGE AMBIENT TEMPERATURE IN DEGREES CELSIUS?
15
ALTITUDE:          0.  TEMPERATURE:        15.
ARE ENTRIES CORRECT (Y/N)?
Y
HOW MANY RUNWAYS ARE THERE?
4

RUNWAY NUMBER  1 START:  X =
10000
Y =
0
END: X =
0
Y =
0
RUNWAY NAME  TAKEOFF:
27
LANDING:
9
COMMENTS:
T.O. RWY 27

RUNWAY NUMBER  2 START:  X =
R
COMMENTS:
T.O. RWY  9

RUNWAY NUMBER  3 START:  X =
7000
Y =
-7000
END: X =
2000
Y =
2000
RUNWAY NAME  TAKEOFF:
31
LANDING:
13
COMMENTS:
T.O. RWY 31

RUNWAY NUMBER  4 START:  X =
R
```

COMMENTS:
T.O. RWY 13

RWY	X-START	Y-START	X-END	Y-END	NAME	COMMENTS
1	10000.	0.	0.	0.	27 9	T.O. RWY 27
2	0.	0.	10000.	0.	9 27	T.O. RWY 9
3	7000.	-7000.	2000.	2000.	31 13	T.O. RWY 31
4	2000.	2000.	7000.	-7000.	13 31	T.O. RWY 13

ENTER NUMBER OF ANY INCORRECT RUNWAY, ENTER 0 IF ALL ARE CORRECT:
0

HOW MANY TRACKS ARE THERE?
4

WHICH RUNWAY (USE THE NUMBER) DOES TRACK 1 START ON?
1
HOW MANY SEGMENTS ARE ON THE TRACK?
1
LENGTH OF SEGMENT 1 IN NAUTICAL MILES:
9

WHICH RUNWAY (USE THE NUMBER) DOES TRACK 2 START ON?
1
HOW MANY SEGMENTS ARE ON THE TRACK?
3
LENGTH OF SEGMENT 1 IN NAUTICAL MILES:
.4
SEGMENT 2 TURN ANGLE IN DEGREES:
45
RADIUS OF TURN IN NAUTICAL MILES:
1.5
LENGTH OF SEGMENT 3 IN NAUTICAL MILES:
52

WHICH RUNWAY (USE THE NUMBER) DOES TRACK 3 START ON?
3
HOW MANY SEGMENTS ARE ON THE TRACK?
1
LENGTH OF SEGMENT 1 IN NAUTICAL MILES:
50

WHICH RUNWAY (USE THE NUMBER) DOES TRACK 4 START ON?
4
HOW MANY SEGMENTS ARE ON THE TRACK?
2
LENGTH OF SEGMENT 1 IN NAUTICAL MILES:
.5
SEGMENT 2 TURN ANGLE IN DEGREES:
90
RADIUS OF TURN IN NAUTICAL MILES:
1.5
IS SEGMENT 3 STRAIGHT OR CURVED?
S
LENGTH OF SEGMENT 3 IN NAUTICAL MILES:
1.5
SEGMENT 4 TURN ANGLE IN DEGREES:
45
RADIUS OF TURN IN NAUTICAL MILES:
1.5

```
LENGTH OF SEGMENT  5 IN NAUTICAL MILES:
[illegible]

WHICH RUNWAY (USE THE NUMBER) DOES TRACK  5 START ON?
2
HOW MANY SEGMENTS ARE ON THE TRACK?
1
LENGTH OF SEGMENT  1 IN NAUTICAL MILES:
50

 RW TK SG  DT1  DT2  RD2  DT3  RD3  DT4  RD4  DT5  RD5  DT6  RD6  DT7  RD7  DT8
  1  1  1  50.
  1  2  3   .5  45.  1.5  50.
  3  3  1  50.
  2  4  5   .5  90. -1.5  1.5   0.  45. -1.5  50.
  2  5  1  50.
ENTER THE NUMBER OF ANY INCORRECT TRACK, ENTER 0 IF TRACKS ARE CORRECT:
2

WHICH RUNWAY (USE THE NUMBER) DOES TRACK  6 START ON?
2
HOW MANY SEGMENTS ARE ON THE TRACK?
3
LENGTH OF SEGMENT  1 IN NAUTICAL MILES:
.5
SEGMENT  2 TURN ANGLE IN DEGREES:
10
RADIUS OF TURN IN NAUTICAL MILES:
1.5
LENGTH OF SEGMENT  3 IN NAUTICAL MILES:
50

WHICH RUNWAY (USE THE NUMBER) DOES TRACK  7 START ON?
4
HOW MANY SEGMENTS ARE ON THE TRACK?
3
LENGTH OF SEGMENT  1 IN NAUTICAL MILES:
.5
-----------------------------------------------------------------------
[illegible]

WHICH RUNWAY (USE THE NUMBER) DOES TRACK  1 START ON?
[illegible]
HOW MANY SEGMENTS ARE ON THE TRACK?
1
LENGTH OF SEGMENT  1 IN NAUTICAL MILES:
10

1500 - 2500 MILES:
20
2500 - 3500 MILES:
22
3500 - 4500 MILES:
-1
COMMENTS:

AIRCRAFT TYPE NUMBER:
101
```

```
AIRCRAFT NAME:
AIRCRAFT Y
NOISE CURVE NUMBER:
101
APPROACH PARAMETER NUMBER:
102

FOR EACH TRIP LENGTH RANGE ENTER A TAKEOFF PROFILE NUMBER ENTER -1 WHEN DONE:
   0 -  500 MILES:
201
 500 - 1000 MILES:
201
1000 - 1500 MILES:
202
1500 - 2500 MILES:
202
2500 - 3500 MILES:
-1
COMMENTS:

AIRCRAFT TYPE NUMBER:
102
AIRCRAFT NAME:
AIRCRAFT Z
NOISE CURVE NUMBER:
20
APPROACH PARAMETER NUMBER:
18

FOR EACH TRIP LENGTH RANGE ENTER A TAKEOFF PROFILE NUMBER ENTER -1 WHEN DONE:
   0 -  500 MILES:
38
 500 - 1000 MILES:
28
1000 - 1500 MILES:
39
1500 - 2500 MILES:
29
2500 - 3500 MILES:
-1
COMMENTS:
```

#	NAME	NOISE CURVE	APPR PROF	TAKEOFF PROFILES FOR TRIP LENGTHS 1	2	3	4	5	6	7
17	AIRCRAFT X	0	0	0	0	29	29	29	0	0
101	AIRCRAFT Y	101	102	201	201	202	202	0	0	0
102	AIRCRAFT Z	20	18	38	28	39	29	0	0	0

```
ENTER THE NUMBER OF ANY INCORRECT AIRCRAFT ENTER 0 IF ALL ARE CORRECT:
0

DO YOU WISH TO ADD OR CHANGE TAKEOFF PROFILES(Y/N)?
Y
HOW MANY?
3
```

```
TAKEOFF PROFILE NUMBER:
18

ENTER THE PROFILE LABEL
REPLACEMENT B727-200 T.O. PROFILE
DO YOU WISH TO ENTER TRACK DISTANCES IN FEET
INSTEAD OF NAUTICAL MILES (Y/N)?
YES
```

#	NAME	NOISE CURVE	APPR PROF	TAKEOFF PROFILES FOR TRIP LENGTHS 1	2	3	4	5	6	7
17	AIRCRAFT X	0	0	0	0	29	29	29	0	0
101	AIRCRAFT Y	101	102	201	201	202	202	0	0	0
102	AIRCRAFT Z	20	18	38	28	39	29	0	0	0

```
ENTER THE NUMBER OF ANY INCORRECT AIRCRAFT ENTER 0 IF ALL ARE CORRECT:
0

DO YOU WISH TO ADD OR CHANGE TAKEOFF PROFILES(Y/N)?
Y
HOW MANY?
3

TAKEOFF PROFILE NUMBER:
19

ENTER THE PROFILE LABEL
REPLACEMENT B727-200 T.O. PROFILE
DO YOU WISH TO ENTER TRACK DISTANCES IN FEET
INSTEAD OF NAUTICAL MILES (Y/N)?
YES
HOW MANY ENGINES ON AIRCRAFT?

TAKEOFF WEIGHT(LBS):
120000
SEGMENT 1:
THRUST:
15000
SEGMENT 2:
DISTANCE FROM RUNWAY END:
5000
AIR SPEED:
160
THRUST:
15000
SEGMENT 3:
DISTANCE FROM RUNWAY END:
25000
HEIGHT ABOVE RUNWAY?
2000
AIR SPEED:
160
THRUST:
15000
SEGMENT 4:
DISTANCE FROM RUNWAY END:
30000
```

```
HEIGHT ABOVE RUNWAY:
4500
AIR SPEED:
160
THRUST:
15000
SEGMENT  5:
DISTANCE FROM RUNWAY END:
25000
HEIGHT ABOVE RUNWAY:
7000
AIR SPEED:
160
THRUST:
15000
SEGMENT  6:
DISTANCE FROM RUNWAY END:
100000
HEIGHT ABOVE RUNWAY:
9500
AIR SPEED:
160
THRUST:
15000
SEGMENT  7:
DISTANCE FROM RUNWAY END:
150000

WHICH RUNWAY (USE THE NUMBER) DOES TRACK  1 START ON?

HOW MANY SEGMENTS ARE ON THE TRACK?

LENGTH OF SEGMENT  1 IN NAUTICAL MILES:
[illegible]

HEIGHT ABOVE RUNWAY:
14500
AIR SPEED:
160

TAKEOFF PROFILE NUMBER:
201

ENTER THE PROFILE LABEL
AIRCRAFT 1 SHORT RANGE T.O. PROFILE
DO YOU WISH TO ENTER TRACK DISTANCES IN FEET
INSTEAD OF NAUTICAL MILES (Y/N)?
Y
HOW MANY ENGINES ON AIRCRAFT:
3
TAKEOFF WEIGHT(LBS):
200000
SEGMENT  1:
THRUST:
20000
SEGMENT  2:
DISTANCE FROM RUNWAY END:
5000
AIR SPEED:
200
```

```
THRUST:
30000
SEGMENT  3:
DISTANCE FROM RUNWAY END:
25000
HEIGHT ABOVE RUNWAY:
2000
AIR SPEED:
200
THRUST:
30000
SEGMENT  4:
DISTANCE FROM RUNWAY END:
[illegible]
HEIGHT ABOVE RUNWAY:
[illegible]
AIR SPEED:
[illegible]
THRUST:
30000
SEGMENT  5:
DISTANCE FROM RUNWAY END:
[illegible]
HEIGHT ABOVE RUNWAY:
[illegible]
AIR SPEED:
200
THRUST:
30000
SEGMENT  6:
DISTANCE FROM RUNWAY END:
100000
HEIGHT ABOVE RUNWAY:
9500
AIR SPEED:
200
THRUST:
30000
SEGMENT  7:
DISTANCE FROM RUNWAY END:
150000
HEIGHT ABOVE RUNWAY:
14500
AIR SPEED:
200

TAKEOFF PROFILE NUMBER:
202

ENTER THE PROFILE LABEL
AIRCRAFT Y LONG RANGE T.O. PROFILE
DO YOU WISH TO ENTER TRACK DISTANCES IN FEET
INSTEAD OF NAUTICAL MILES (Y/N)?
```

```
[illegible]
30000
SEGMENT  6:
DISTANCE FROM RUNWAY END:
100000
HEIGHT ABOVE RUNWAY:
9500
```

```
AIR SPEED:
200
THRUST:
20000
SEGMENT 2:
DISTANCE FROM RUNWAY END:
150000
HEIGHT ABOVE RUNWAY:
14000
AIR SPEED:
200

TAKEOFF PROFILE NUMBER:
002

ENTER TAKEOFF [illegible]
AIRCRAFT X LONG RANGE T.O. PROFILE
DO YOU WISH TO [illegible] TRACK DISTANCES IN FEET
INSTEAD OF NAUTICAL MILES (Y/N)?

HOW MANY ENGINES ON AIRCRAFT:
2
TAKEOFF WEIGHT(LBS):
350000
SEGMENT 1:
THRUST:
[illegible]
SEGMENT 2:
DISTANCE FROM RUNWAY END:
10000
AIR SPEED:
[illegible]
THRUST:
50000
SEGMENT 3:
DISTANCE FROM RUNWAY END:
20000
HEIGHT ABOVE RUNWAY:
[illegible]
AIR SPEED:
[illegible]
THRUST:
40000
SEGMENT 4:
DISTANCE FROM RUNWAY END:
30000
HEIGHT ABOVE RUNWAY:
3000
AIR SPEED:
250
THRUST:
30000
SEGMENT 5:
DISTANCE FROM RUNWAY END:
70000
HEIGHT ABOVE RUNWAY:
6000
AIR SPEED:
250
```

```
THRUST:
30000
SEGMENT 6:
DISTANCE FROM RUNWAY END:
100000
HEIGHT ABOVE RUNWAY:
9000
AIR SPEED:
250
THRUST:
30000
SEGMENT 7:
DISTANCE FROM RUNWAY END:
150000
HEIGHT ABOVE RUNWAY:
14000
AIR SPEED:
250

PROFILE  18REPLACEMENT B727-200 T.O. PROFILE
      3. ENGINES    TAKEOFF WEIGHT(LBS): 120000.          1
SEGMENT DISTANCE    HEIGHT     SPEED    THRUST
   1          0.         0.       32.   15000.
   2       5000.         0.      160.   15000.
   3      25000.      2000.      160.   15000.
   4      50000.      4500.      160.   15000.
   5      75000.      7000.      160.   15000.
   6     100000.      9500.      160.   15000.
   7     150000.     14500.      160.
PROFILE 201AIRCRAFT Y SHORT RANGE T.O. PROFILE
      3. ENGINES    TAKEOFF WEIGHT(LBS): 300000.          1
SEGMENT DISTANCE    HEIGHT     SPEED    THRUST
   1          0.         0.       32.   30000.
   2       5000.         0.      200.   30000.
   3      25000.      2000.      200.   30000.
   4      50000.      4500.      200.   30000.
   5      75000.      7000.      200.   30000.
   6     100000      9500.      200.   30000.
   7     150000.     14500.      200.
PROFILE 202AIRCRAFT Y LONG RANGE T.O. PROFILE
      3. ENGINES    TAKEOFF WEIGHT(LBS): 350000.          1
SEGMENT DISTANCE    HEIGHT     SPEED    THRUST
   1          0.         0.       32.   30000.
   2      10000.         0.      250.   30000.
   3      20000.      2000.      250.   30000.
   4      50000.      4000.      250.   30000.
   5      70000.      6000       250.   30000.
   6     100000.      9000.      250.   30000.
   7     150000.     14000.      250.
ENTER THE NUMBER OF ANY INCORRECT PROFILE ENTER 0 IF ALL ARE CORRECT:
0

HOW MANY APPROACH PROFILES ARE THERE:
1

APPROACH PROFILE  1
ENTER THE PROFILE LABEL
STANDARD 3 DEGREE APPROACH
HOW MANY SEGMENTS ARE ON THE PROFILE:
6
```

```
SEGMENT  1:
HEIGHT ABOVE RUNWAY:
0
AIR SPEED:
[illegible]
THRUST:
300
SEGMENT  2:
DISTANCE FROM RUNWAY END:
[illegible],135
HEIGHT ABOVE RUNWAY:
0
AIR SPEED:
LANDING
THRUST:
LAND 3 DEG GLIDE
SEGMENT  3:
DISTANCE FROM RUNWAY END:
[illegible],875
HEIGHT ABOVE RUNWAY:
1600
AIR SPEED:
LANDING
THRUST:
APPROACH 3 DEGREE GLIDE
SEGMENT  4:
DISTANCE FROM RUNWAY END:
[illegible],125
HEIGHT ABOVE RUNWAY:
3000
AIR SPEED:
LANDING
THRUST:
APPROACH 3 DEGREE GLIDE
SEGMENT  5:
DISTANCE FROM RUNWAY END:
12,325
HEIGHT ABOVE RUNWAY:
4000
AIR SPEED:
LANDING
THRUST:
APPROACH 3 DEGREE GLIDE
SEGMENT  6:
DISTANCE FROM RUNWAY END:
16,625
HEIGHT ABOVE RUNWAY:
5000
AIR SPEED:
LANDING

APPROACH PROFILE  2
ENTER THE PROFILE LABEL
STANDARD 3 DEGREE APPROACH        WITH LEVEL SEGMENT
HOW MANY SEGMENTS ARE ON THE PROFILE?
[illegible]
SEGMENT  1:
HEIGHT ABOVE RUNWAY:
[illegible]
```

```
AIR SPEED:
32
THRUST:
REV
SEGMENT  2:
DISTANCE FROM RUNWAY END:
-.165
HEIGHT ABOVE RUNWAY:
0
AIR SPEED:
LANDING
THRUST:
LANDING 3 DEGREE GLIDE
SEGMENT  3:
DISTANCE FROM RUNWAY END:
2.975
HEIGHT ABOVE RUNWAY:
1000
AIR SPEED:
LANDING
THRUST:
APPROACH 3 DEGREE GLIDE
SEGMENT  4:
DISTANCE FROM RUNWAY END:
9.255
HEIGHT ABOVE RUNWAY:
3000
```

```
HEIGHT ABOVE RUNWAY:
3000
AIR SPEED:
LANDING
THRUST:
APPROACH 3 DEGREE GLIDE
SEGMENT  6:
DISTANCE FROM RUNWAY END:
15.14
HEIGHT ABOVE RUNWAY:
4000
AIR SPEED:
LANDING

APPROACH PROFILE  3
ENTER THE PROFILE LABEL
GA, 3 DEGREE APPROACH
HOW MANY SEGMENTS ARE ON THE PROFILE?
6
SEGMENT  1:
HEIGHT ABOVE RUNWAY:
0
AIR SPEED:
32
THRUST:
LAND 3 DEGREE GLIDE
SEGMENT  2:
DISTANCE FROM RUNWAY END:
-.165
HEIGHT ABOVE RUNWAY:
0
AIR SPEED:
LANDING
```

THRUST:
LAND 3 DEGREE GLIDE
SEGMENT 3:
DISTANCE FROM RUNWAY END:
2,975
HEIGHT ABOVE RUNWAY:
1000
AIR SPEED:
LANDING
THRUST:
LAND 3 DEGREE GLIDE
SEGMENT 4:
DISTANCE FROM RUNWAY END:
[illegible]
HEIGHT ABOVE RUNWAY:
3000
AIR SPEED:
LANDING
THRUST:
LAND 3 DEGREE GLIDE
SEGMENT 5:
DISTANCE FROM RUNWAY END:
[illegible]
HEIGHT ABOVE RUNWAY:
[illegible]
AIR SPEED:
[illegible]
THRUST:
LAND 3 DEGREE GLIDE
SEGMENT 6:
DISTANCE FROM RUNWAY END:
[illegible]
HEIGHT ABOVE RUNWAY:
[illegible]
AIR SPEED:
[illegible]

[illegible] 3 DEGREE APPROACH

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	[illegible]	0.	[illegible]	REV
[illegible]	[illegible]	0.	LAND	LND 3 G
3	[illegible]	1000.	LAND AP	3 GLI
[illegible]	[illegible]	3000.	LAND AP	3 GLI
[illegible]	[illegible]	[illegible]	LAND AP	3 GLI
6	[illegible]	5000.	LAND	

[illegible] 3 DEGREE APPROACH WITH LEVEL SEGMENT

SEGMENT	DISTANCE	HEIGHT	SPEED	THRUST
1	[illegible]	0.		REV
[illegible]	[illegible]	0.	LAND	LND 3 G
[illegible]	[illegible]	[illegible]	LAND AP	3 GLI
[illegible]	[illegible]	3000.	LAND	LVL APR
[illegible]	[illegible]	3000.	LAND AP	3 GLI
6	[illegible]	[illegible]	LAND	

```
[illegible] APPROACH
SEGMENT  DIS SPEC   HEIGHT    SPEED   THRUST
[illegible]
[illegible] ENTER 0 IF ALL ARE CORRECT:
[illegible]

[illegible] APPROACH PARAMETERS(Y/N)?
[illegible]
[illegible]
[illegible]

APPROACH PARAMETER NUMBER:
101
AIRCRAFT NAME:
ACFT X
LANDING WEIGHT (LBS):
100000
NUMBER OF ENGINES:
4
LANDING ROLL DISTANCE (FT):
5000
LANDING SPEED (KNOTS):
150
THRUST FOR 3DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):
10000
THRUST FOR 6DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):
0
THRUST FOR LEVEL FLIGHT WITH APPROACH FLAPS (LBS/ENG):
0
THRUST FOR 3DEG GLIDE SLOPE WITH APPROACH FLAPS (LBS/ENG):
10000
THRUST FOR LEVEL FLIGHT WITH MANEUVER FLAPS (LBS/ENG):
0
THRUST FOR 500 FT/NM DESCENT WITH MANEUVER FLAPS (LBS/ENG):
0
THRUST FOR IDLE (LBS/ENG):
0
THRUST FOR REVERSAL (LBS/ENG):
15000

APPROACH PARAMETER NUMBER:
102
AIRCRAFT NAME:
ACFT Y
LANDING WEIGHT (LBS):
200000
NUMBER OF ENGINES:
3
LANDING ROLL DISTANCE (FT):
3000
LANDING SPEED (KNOTS):
180
THRUST FOR 3DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):
15000
```

```
THRUST FOR 6DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):
8000
THRUST FOR LEVEL FLIGHT WITH APPROACH FLAPS (LBS/ENG):
10000
THRUST FOR 3DEG GLIDE SLOPE WITH APPROACH FLAPS (LBS/ENG):
12000
THRUST FOR LEVEL FLIGHT WITH MANEUVER FLAPS (LBS/ENG):
7000
THRUST FOR 500 FT/NM DESCENT WITH MANEUVER FLAPS (LBS/ENG):
7500
THRUST FOR IDLE (LBS/ENG):
4000
THRUST FOR REVERSAL (LBS/ENG):
20000

101 ACFT X          WEIGHT-    100000.            4. ENGINES
TO STOP     5000.  LAND         150. 3DG LND  10000. 6DG LND       0.
 LVL APP       0. 3DG APP   10000. LVL MAN       0. SNK MAN       0.
  IDLE         0. REVERSE   15000.
102 ACFT Y          WEIGHT-    200000.            3. ENGINES
TO STOP     3000.  LAND         180. 3DG LND  15000. 6DG LND    8000.
 LVL APP   10000. 3DG APP   12000. LVL MAN    7000. SNK MAN    7500.
  IDLE      4000. REVERSE   20000.
ENTER THE NUMBER OF ANY INCORRECT PARAMETER SET ENTER 0 IF ALL ARE CORRECT:
0

DO YOU WISH TO ADD OR CHANGE NOISE CURVE DATA SETS (Y/N)?
Y
HOW MANY
1

NOISE CURVE IDENTIFICATION NUMBER:
101
NOISE CURVE TITLE:
TABLES FOR AIRCRAFT Y
NUMBER OF THRUST VALUES:
3

CORRECTED NET THRUST/ENG (LBS):
30000
EPNL AT    200 FT (DECIBELS):
105
EPNL AT    400 FT (DECIBELS):
100
EPNL AT    600 FT (DECIBELS):
95
EPNL AT   1000 FT (DECIBELS):
90
EPNL AT   2000 FT (DECIBELS):
85
EPNL AT   4000 FT (DECIBELS):
80
EPNL AT   6000 FT (DECIBELS):
75
EPNL AT  10000 FT (DECIBELS):
70
NEL AT    200 FT (DECIBELS):
100
```

NEL AT 400 FT (DECIBELS):
95
NEL AT 600 FT (DECIBELS):
90
NEL AT 1000 FT (DECIBELS):
85
NEL AT 2000 FT (DECIBELS):
80
NEL AT 4000 FT (DECIBELS):
75
NEL AT 6000 FT (DECIBELS):
70
NEL AT 10000 FT (DECIBELS):
65

CORRECTED NET THRUST/ENG (LBS):
20000
EPNL AT 200 FT (DECIBELS):
100
EPNL AT 400 FT (DECIBELS):
95
EPNL AT 600 FT (DECIBELS):
90
EPNL AT 1000 FT (DECIBELS):
85
EPNL AT 2000 FT (DECIBELS):
80
EPNL AT 4000 FT (DECIBELS):
75
EPNL AT 6000 FT (DECIBELS):
70
EPNL AT 10000 FT (DECIBELS):
65
NEL AT 200 FT (DECIBELS):
95
NEL AT 400 FT (DECIBELS):
90
NEL AT 600 FT (DECIBELS):
85
NEL AT 1000 FT (DECIBELS):
80
NEL AT 2000 FT (DECIBELS):
75
NEL AT 4000 FT (DECIBELS):
70
NEL AT 6000 FT (DECIBELS):
65
NEL AT 10000 FT (DECIBELS):
60

CORRECTED NET THRUST/ENG (LBS):
10000
EPNL AT 200 FT (DECIBELS):
95
EPNL AT 400 FT (DECIBELS):
90
EPNL AT 600 FT (DECIBELS):
85

```
EPNL AT  1000 FT (DECIBELS):
80
EPNL AT  2000 FT (DECIBELS):
75
EPNL AT  4000 FT (DECIBELS):
70
EPNL AT  6000 FT (DECIBELS):
65
EPNL AT 10000 FT (DECIBELS):
60
NEL  AT   200 FT (DECIBELS):
90
NEL  AT   400 FT (DECIBELS):
85
NEL  AT   600 FT (DECIBELS):
80
NEL  AT  1000 FT (DECIBELS):
75
NEL  AT  2000 FT (DECIBELS):
70
NEL  AT  4000 FT (DECIBELS):
65
NEL  AT  6000 FT (DECIBELS):
60
NEL  AT 10000 FT (DECIBELS):
55

101              TABLES FOR AIRCRAFT Y
*   THRUST FEET:200      400      600     1000     2000     4000     6000    10000
EPNL
1   30000.      105.     100.      95.      90.      85.      80.      75.      70.
2   20000.      100.      95.      90.      85.      80.      75.      70.      65.
3   10000.       95.      90.      85.      80.      75.      70.      65.      60.
NEL
1   30000.      100.      95.      90.      85.      80.      75.      70.      65.
2   20000.       95.      90.      85.      80.      75.      70.      65.      60.
3   10000.       90.      85.      80.      75.      70.      65.      60.      55.
IS THE NOISE CURVE DATA CORRECT?
Y

DO YOU WISH TO ADD ANOTHER NOISE CURVE DATA SET?
N

AIRCRAFT TYPE:
BAC-111
GROUND TRACK NUMBER:
7
APPROACH PROFILE NUMBER:
0
DAILY ARRIVALS DAY:
0
EVENING:
0
NIGHT:
0
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO  500 DAY:
3
```

EVENING:

1

NIGHT:

1

STAGE LENGTH 500 TO 1000 DAY:

2

EVENING:

1.5

NIGHT:

AIRCRAFT TYPE:

BAC-111

GROUND TRACK NUMBER:

8

APPROACH PROFILE NUMBER:

0

DAILY ARRIVALS DAY:

0

EVENING:

0

NIGHT:

0

ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH 0 TO 500 DAY:

0

EVENING:

0

NIGHT:

0

STAGE LENGTH 500 TO 1000 DAY:

0

EVENING:

0

NIGHT:

0

STAGE LENGTH 1000 TO 1500 DAY:

3

EVENING:

1

NIGHT:

1

STAGE LENGTH 1500 TO 2500 DAY:

2

EVENING:

0

NIGHT:

1.5

AIRCRAFT TYPE:

BAC-111

GROUND TRACK NUMBER:

9

APPROACH PROFILE NUMBER:

1

DAILY ARRIVALS DAY:

9

EVENING:

4

```
NIGHT:
1
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH     0 TO  500 DAY:
-

AIRCRAFT TYPE:
727-200
GROUND TRACK NUMBER:
6
APPROACH PROFILE NUMBER:
2
DAILY ARRIVALS DAY:
1
EVENING:
1
NIGHT:
2
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH     0 TO  500 DAY:
2
EVENING:
1
NIGHT:
0
STAGE LENGTH  500 TO 1000 DAY:
2
EVENING:
1
NIGHT:
0
STAGE LENGTH 1000 TO 1500 DAY:
2
EVENING:
1
NIGHT:
-

AIRCRAFT TYPE:
707-120B
GROUND TRACK NUMBER:
3
APPROACH PROFILE NUMBER:
1
DAILY ARRIVALS DAY:
10
EVENING:
2
NIGHT:
5
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH     0 TO  500 DAY:
5
EVENING:
1
NIGHT:
6
STAGE LENGTH  500 TO 1000 DAY:
2
```

```
EVENING:
0
NIGHT:
1
STAGE LENGTH 1000 TO 1500 DAY:
3
EVENING:
0
NIGHT:
1
STAGE LENGTH 1500 TO 2500 DAY:
2
EVENING:
-

   1 AIRCRAFT:  BAC 111 TRACK:  7 PROFILE:   0 ARRIVALS DAY: 0. EVN: 0. NIGHT: 0.
DEPARTURES  RANGE   DAY EVN NGT    RANGE     DAY EVN NGT     RANGE     DAY EVN NGT
            0-500    3.  1.  1.   500-1000    2. 1.5       1000-1500

   2 AIRCRAFT:  BAC 111 TRACK:  8 PROFILE:   0 ARRIVALS DAY: 0. EVN: 0. NIGHT: 0.
DEPARTURES  RANGE   DAY EVN NGT    RANGE     DAY EVN NGT     RANGE     DAY EVN NGT
            0-500    0.  0.  0.   500-1000    0.  0.  0.   1000-1500    3.  1.  1.
        1500-2500    2.  0. 1.5  2500-3500                 3500-4500

   3 AIRCRAFT:  BAC 111 TRACK:  9 PROFILE:   1 ARRIVALS DAY: 9. EVN: 4. NIGHT: 4.

   4 AIRCRAFT:  727 200 TRACK:  6 PROFILE:   2 ARRIVALS DAY: 4. EVN: 3. NIGHT: 2.
DEPARTURES  RANGE   DAY EVN NGT    RANGE     DAY EVN NGT     RANGE     DAY EVN NGT
            0-500    2.  1.  0.   500-1000    2.  1.  0.   1000-1500    2.  1.

   5 AIRCRAFT: 707 120B TRACK:  3 PROFILE:   1 ARRIVALS DAY:10. EVN: 2. NIGHT: 5.
DEPARTURES  RANGE   DAY EVN NGT    RANGE     DAY EVN NGT     RANGE     DAY EVN NGT
            0-500    5.  1.  3.   500-1000    2.  0.  1.   1000-1500    3.  0.  1.
        1500-2500    1.          2500-3500                 3500-4500
ENTER THE NUMBER OF ANY INCORRECT ENTRY. ENTER 0 IF ALL ARE CORRECT:
0

AIRCRAFT TYPE:
VC-10
GROUND TRACK NUMBER:
1
APPROACH PROFILE NUMBER:
1
DAILY ARRIVALS DAY:
5
EVENING:
2
NIGHT:
1
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO  500 DAY:
6
EVENING:
0
NIGHT:
1
STAGE LENGTH  500 TO 1000 DAY:
0
```

```
EVENING:
0
NIGHT:
0
STAGE LENGTH 1000 TO 1500 DAY:
2
EVENING:
0
NIGHT:
2
STAGE LENGTH 1500 TO 2500 DAY:
0
EVENING:
0
NIGHT:
0
STAGE LENGTH 2500 TO 3500 DAY:
2
EVENING:
0
NIGHT:
2
STAGE LENGTH 3500 TO 4500 DAY:
-
AIRCRAFT TYPE:
CESSNA 182
GROUND TRACK NUMBER:
4
APPROACH PROFILE NUMBER:
[illegible]
DAILY ARRIVALS DAY:
0
EVENING:
[illegible]
NIGHT:
[illegible]
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO  500 DAY:
25
EVENING:
2
NIGHT:
[illegible]
-

AIRCRAFT TYPE:
CESSNA 182
GROUND TRACK NUMBER:
2
APPROACH PROFILE NUMBER:
3
DAILY ARRIVALS DAY:
25
EVENING:
5
NIGHT:
10
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH    0 TO  500 DAY:
-
```

AIRCRAFT TYPE:
101
GROUND TRACK NUMBER:
_
APPROACH PROFILE NUMBER:
2
DAILY ARRIVALS DAY:
8
EVENING:
1
NIGHT:
1
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH 0 TO 500 DAY:
0
EVENING:
0
NIGHT:
0
STAGE LENGTH 500 TO 1000 DAY:
0
EVENING:
0
NIGHT:
0
STAGE LENGTH 1000 TO 1500 DAY:
8
EVENING:
1
NIGHT:
1
STAGE LENGTH 1500 TO 2500 DAY:
-

AIRCRAFT TYPE:
102
GROUND TRACK NUMBER:
2
APPROACH PROFILE NUMBER:
1
DAILY ARRIVALS DAY:
4
EVENING:
0
NIGHT:
0
DAILY ARRIVALS DAY:
8
EVENING:
1
NIGHT:
-
ENTER "-" TO END INPUT OF DEPARTURES
STAGE LENGTH 0 TO 500 DAY:
6
EVENING:
0
NIGHT:
2

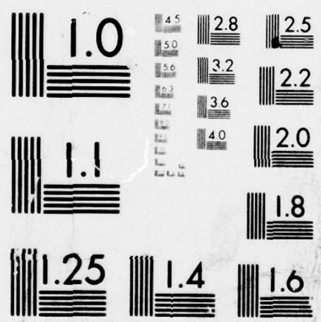
```
STAGE LENGTH  500 TO 1000 DAY:
0
EVENING:
0
NIGHT:
0
STAGE LENGTH 1000 TO 1500 DAY:
8
EVENING:
1
NIGHT:
1
STAGE LENGTH 1500 TO 2500 DAY:

AIRCRAFT TYPE:
102
GROUND TRACK NUMBER:

APPROACH PROFILE NUMBER:
1
DAILY ARRIVALS DAY:
4
EVENING:
0
NIGHT:
0
ENTER '-' TO END INPUT OF DEPARTURES
STAGE LENGTH  0 TO  500 DAY:
2
EVENING:
0
NIGHT:

STAGE LENGTH  500 TO 1000 DAY:
1
EVENING:
0
NIGHT:
0
STAGE LENGTH 1000 TO 1500 DAY:
1
EVENING:

-

  6 AIRCRAFT:     VC 10 TRACK:  1 PROFILE:   1 ARRIVALS DAY: 5. EVN: 2. NIGHT: 1.
DEPARTURES  RANGE   DAY EVN NGT    RANGE    DAY EVN NGT    RANGE    DAY EVN NGT
             0-500   0.  0.  0.   500-1000   0.  0.  0.  1000-1500   2.  0.  2.
         1500-2500   0.  0.  0.  2500-3500   2.  0.  2.  3500-4500

  7 AIRCRAFT:     MSEP6 TRACK:  4 PROFILE:   0 ARRIVALS DAY: 0. EVN: 0. NIGHT: 0.
DEPARTURES  RANGE   DAY EVN NGT    RANGE    DAY EVN NGT    RANGE    DAY EVN NGT
             0-500  25.  5. 10.   500-1000               1000-1500

  8 AIRCRAFT:     MSEP6 TRACK:  2 PROFILE:   3 ARRIVALS DAY:25. EVN: 5. NIGHT:10.

  9 AIRCRAFT: USER 101 TRACK:  5 PROFILE:   2 ARRIVALS DAY: 8. EVN: 1. NIGHT: 1.
DEPARTURES  RANGE   DAY EVN NGT    RANGE    DAY EVN NGT    RANGE    DAY EVN NGT
             0-500   0.  0.  0.   500-1000   0.  0.  0.  1000-1500   8.  1.  1.

 10 AIRCRAFT: USER 102 TRACK:  3 PROFILE:   1 ARRIVALS DAY: 4. EVN: 0. NIGHT: 0.
DEPARTURES  RANGE   DAY EVN NGT    RANGE    DAY EVN NGT    RANGE    DAY EVN NGT
             0-500   2.  0.  0.   500-1000   1.  0.  0.  1000-1500   1.
```

```
ENTER THE NUMBER OF ANY INCORRECT ENTRY, ENTER 0 IF ALL ARE CORRECT:
0

AIRCRAFT TYPE:
0

ENTER THE NUMBER OF ANY INCORRECT ENTRY, ENTER 0 IF ALL ARE CORRECT:
0

DO YOU WISH TO ADD ANY TAKEOFF MODIFICATIONS?
Y
DO YOU WISH TO ENTER ANY OVERRIDES OF TAKEOFF  MODIFICATIONS (Y/N)?
Y

NOISE CURVE SET NUMBER ENTER 0 IF DONE:
11
OVERRIDE TYPE:
1

NOISE CURVE SET NUMBER ENTER 0 IF DONE:
0

NOISE CURVE SET     1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20
OVERRIDE  NUMBER    0  0  0  0  0  0  0  0  0  0  1  0  0  0  0  0  0  0  0  0
NOISE CURVE SET    21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
OVERRIDE  NUMBER    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
ENTER NOISE CURVE NUMBER WITH INCORRECT OVERRIDE, ENTER 0 IF ALL ARE CORRECT:
0

HOW MANY MODIFICATIONS ARE THERE?
2

MODIFICATION  1  TYPE:
1
START:
3000
END:
10
AFFECTED TRACK ENTER 0 IF DONE:
3
AFFECTED TRACK ENTER 0 IF DONE:
0

MODIFICATION  2  TYPE:
5
GRADIENT:
.04
START:
2
END:
3000
AFFECTED TRACK ENTER 0 IF DONE:
7
AFFECTED TRACK ENTER 0 IF DONE:
8
AFFECTED TRACK ENTER 0 IF DONE:
0
```

AD-A079 493 FEDERAL AVIATION ADMINISTRATION WASHINGTON DC OFFICE --ETC F/G 1/2
INTEGRATED NOISE MODEL (INM). VERSION 2. USER'S GUIDE,(U)
SEP 79 T CONNOR, R HINCKLEY
UNCLASSIFIED FAA-AEE-79-09 NL

5 OF 5
AD
A079493

END
DATE
FILMED
2-80
DDC



MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

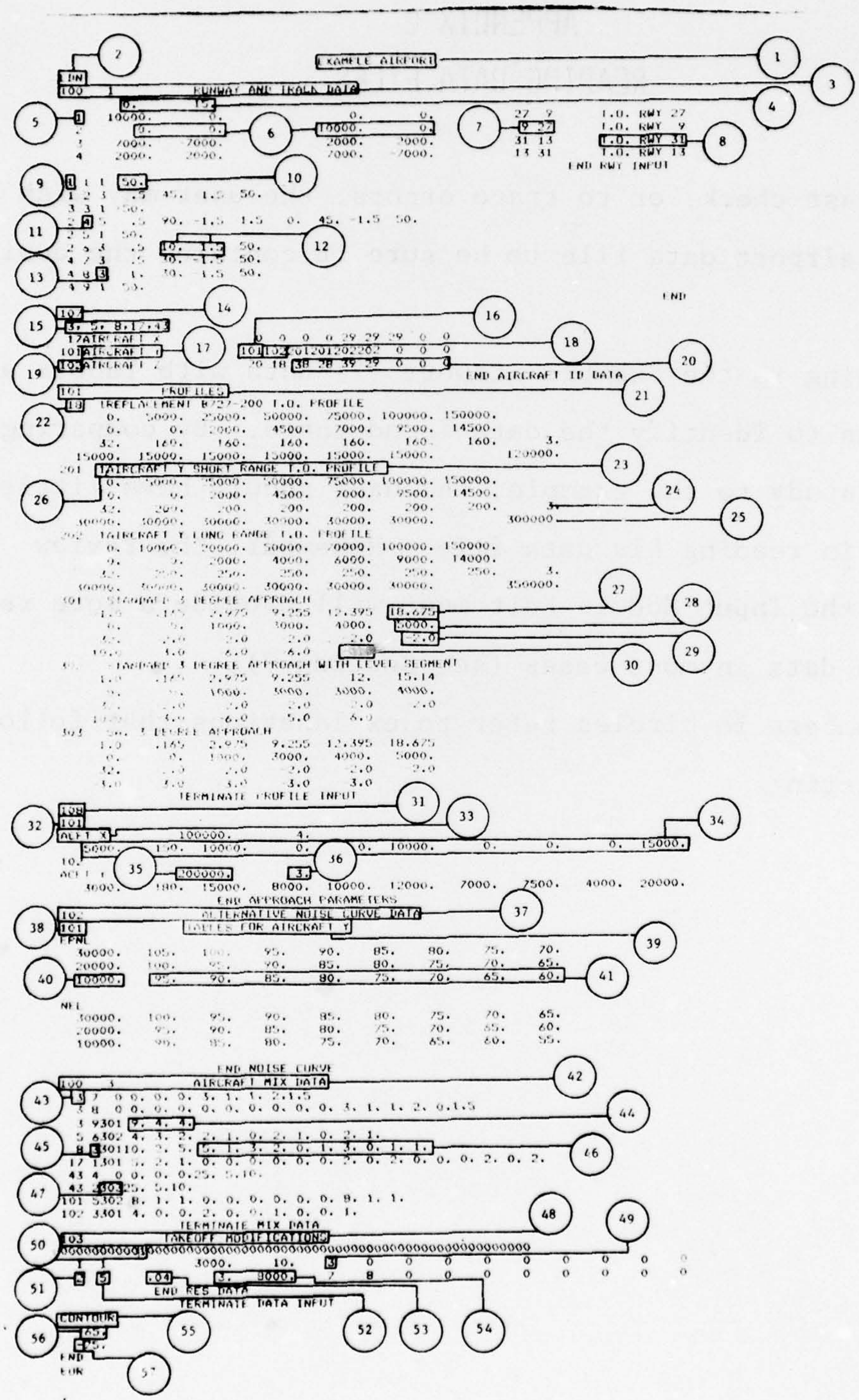
```
 #  REST TYP GRADIENT  START      END      TRACES AFFECTED
 1        1            3000.      10    3  9  0  0  0  0  0  0  0  0
 2        5     .04      3.     8000.   7  8  0  0  0  0  0  0  0  0
ENTER THE NUMBER OF ANY MODIFICATION WITH AN ERROR
ENTER A 0 IF ALL ENTRIES ARE CORRECT:
0

FAA INTEGRATED NOISE MODEL INPUT MODULE
        CREATE
        EDIT
        CONTROL OUTPUT
        END
ENTER THE ACTION YOU WISH TO PERFORM:
END

END OF EXECUTION
```

APPENDIX C
READING DATA FILES

As a last check, or to trace errors, the user may wish to examine an airport data file to be sure it contains the desired data.

Following is the Example Airport (2) data with labels and explanations to identify the data found there. By comparing the file under study to the example, the user should have little difficulty in reading his data file. Remember, the review command in the Input Module Edit mode will provide a more readable copy of the data in most cases (see Section 7).

The numbers in circles refer to explanations that follow the data listing


EXAMPLE AIRPORT
RUNWAY AND TRACK DATA
END RWY INPUT
END AIRCRAFT ID DATA
PROFILES
REPLACEMENT B727-200 T.O. PROFILE
AIRCRAFT Y SHORT RANGE T.O. PROFILE
AIRCRAFT Y LONG RANGE T.O. PROFILE
STANDARD 3 DEGREE APPROACH
STANDARD 3 DEGREE APPROACH WITH LEVEL SEGMENT
TERMINATE PROFILE INPUT
END APPROACH PARAMETERS
ALTERNATIVE NOISE CURVE DATA
TABLES FOR AIRCRAFT Y
EPNL
NEL
END NOISE CURVE
AIRCRAFT MIX DATA
TERMINATE MIX DATA
TAKEOFF MODIFICATIONS
END RES DATA
TERMINATE DATA INPUT
CONTOUR
END
EOR

LEGEND FOR DATA FILES OF APPENDIX C

1. Title for all output
2. Noise Metric
3. Runway and track data begin
4. Airport altitude and ambient temperature
5. Runway number
6. Runway end point coordinates
7. Runway name
8. Runway label
9. Runway that track is connected to
10. Length of segment in nautical miles
11. Track number
12. Turn angle, radius of turn of a track segment
13. Number of segments on track
14. Begin aircraft retrieval data and definitions
15. List of aircraft in traffic mix data
16. Noise curve number of aircraft being defined.
17. Aircraft type name
18. Approach parameter set number of aircraft being defined.
19. Aircraft type number
20. Takeoff profile number for each possible trip length
21. Begin takeoff and approach profile data
22. Profile number

LEGEND FOR DATA FILES OF APPENDIX C (CONT)

23. Profile label

24. Number of engines (takeoff profiles only)

25. Takeoff weight (takeoff profiles only)

26. Indicates distance (see #27) is in feet instead of nautical miles

27. Distance from runway end of points on profile (-1.0 is stopping distance)

28. Aircraft height above runway

29. Aircraft speed (-2.0 is landing speed)

30. Aircraft thrust setting (-3.0 to -10.0 are indicators of general settings)

31. Begin approach parameter data

32. Approach parameter set number

33. Aircraft name

34. Set of approach profile indicator values

35. Landing weight

36. Number of engines.

37. Begin alternative noise curve data

38. Noise curve number

39. Noise curve label

40. Corrected net thrust setting (lbs/engine)

41. Noise level (dB) at increasing distance from aircraft

42. Begin aircraft traffic mix data

LEGEND FOR DATA FILES OF APPENDIX C (CONT)

43. Aircraft type number

44. Aircraft arrivals (day, evening, night)

45. Track number

46. Aircraft departures for each trip length range

47. Approach profile number

48. Begin takeoff modification data

49. Affected track

50. Modification override (column number corresponds to affected noise curve)

51. Modification number

52. Modification type

53. Gradient

54. Start and end points of modification along track

55. Specifies contour output

56. Contour value

57. Marks last contour value

APPENDIX D

BLANK INPUT MODULE DATA SHEETS

The user should make photocopies of the following data sheets to record airport data and output specifications. Some sheets are continuation forms for data that requires more than one page.

As explained in Section 1, not every type of data sheet will be needed for every case study.

RUNWAY DATA SHEET

DATA FILE NAME:

WHAT IS THE AIRPORTS ALTITUDE IN FEET ABOVE SEA LEVEL?
WHAT IS THE AVERAGE AMBIENT TEMPERATURE IN DEGREES CELSIUS?

RUNWAY NUMBER 1
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 2
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 3
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 4
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 5
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY DATA SHEET (CONT'D)

RUNWAY NUMBER 6
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 7
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 8
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 9
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 10
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 11
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY DATA SHEET (CONT'D)

RUNWAY NUMBER 12
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 13
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 14
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

RUNWAY NUMBER 15
START: X =
Y =
END: X =
Y =
RUNWAY NAME TAKEOFF: LANDING:
COMMENTS:

TRACK DATA SHEET

HOW MANY TRACKS ARE THERE?
WHICH RUNWAY DOES THE TRACK START ON?
HOW MANY SEGMENTS ARE ON THE TRACK?

SEGMENT 1 LENGTH:

SEGMENT 2 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 3 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 4 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 5 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 6 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 7 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 8 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 9 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 10 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 11 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 12 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 13 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH: RADIUS OF TURN:

SEGMENT 14 STRAIGHT OR CURVED: TURN ANGLE:
LENGTH RADIUS OF TURN:

SEGMENT 15 LENGTH:

APPROACH PROFILE DATA SHEET

HOW MANY APPROACH PROFILES ARE THERE:

ENTER THE PROFILE LABEL:

HOW MANY POINTS ARE ON THE PROFILE?

FOR SEGMENT 1:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

FOR SEGMENT 2:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

FOR SEGMENT 3:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY
AIR SPEED:
THRUST:

FOR SEGMENT 4:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

FOR SEGMENT 5:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

FOR SEGMENT 6:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

FOR SEGMENT 7:
DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:

TRAFFIC MIX DATA SHEET

AIRCRAFT TYPE:
GROUND TRACK NUMBER:
APPROACH PROFILE NUMBER:

DAILY ARRIVALS		DAY:
		EVENING:
		NIGHT:
ENTER "-" TO END INPUT OF DEPARTURES		
STAGE LENGTH	0 TO 500	DAY:
		EVENING:
		NIGHT:
STAGE LENGTH	500 TO 1000	DAY:
		EVENING:
		NIGHT:
STAGE LENGTH	1000 TO 1500	DAY:
		EVENING:
		NIGHT:
STAGE LENGTH	1500 TO 2500	DAY:
		EVENING:
		NIGHT:
STAGE LENGTH	2500 TO 3500	DAY:
		EVENING:
		NIGHT:
STAGE LENGTH	3500 TO 4500	DAY:
		EVENING:
		NIGHT:
STAGE LENGTH	4500 TO 9999	DAY:
		EVENING:
		NIGHT:

AIRCRAFT DEFINITION DATA SHEET

HOW MANY?

AIRCRAFT TYPE NUMBER:

AIRCRAFT NAME:

NOISE CURVE NUMBER:

APPROACH PARAMETER NUMBER:

FOR EACH TRIP LENGTH RANGE, ENTER A TAKEOFF PROFILE NUMBER

0- 500 MILES:

500-1000 MILES:

1000-1500 MILES:

1500-2500 MILES:

2500-3500 MILES:

3500-4500 MILES:

4500-9999 MILES:

COMMENTS:

TAKEOFF PROFILE DATA SHEET

HOW MANY?

TAKEOFF PROFILE NUMBER:

TAKEOFF PROFILE LABEL:

DO YOU WISH TO ENTER TRACK DISTANCES IN FEET INSTEAD OF NAUTICAL MILES:

HOW MANY ENGINES ON AIRCRAFT?

TAKEOFF WEIGHT (LBS):

SEGMENT 1 THRUST:

SEGMENT 2 DISTANCE FROM RUNWAY END:
AIR SPEED:
THRUST:

SEGMENT 3 DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

SEGMENT 4 DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

SEGMENT 5 DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

SEGMENT 6 DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:
THRUST:

SEGMENT 7 DISTANCE FROM RUNWAY END:
HEIGHT ABOVE RUNWAY:
AIR SPEED:

APPROACH PARAMETER DATA SHEET

HOW MANY?

APPROACH PARAMETER NUMBER:

AIRCRAFT NAME:

LANDING WEIGHT (LBS):

NUMBER OF ENGINES:

LANDING ROLL DISTANCE (FEET):

LANDING SPEED (KNOTS):

THRUST FOR 3DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):

THRUST FOR 6DEG GLIDE SLOPE WITH LANDING FLAPS (LBS/ENG):

THRUST FOR LEVEL FLIGHT WITH APPROACH FLAPS (LBS/ENG):

THRUST FOR 3DEG GLIDE SLOPE WITH APPROACH FLAPS (LBS/ENG):

THRUST FOR LEVEL FLIGHT WITH MANEUVER FLAPS (LBS/ENG):

THRUST FOR 500 FT/NM DESCENT WITH MANEUVER FLAPS (LBS/ENG):

THRUST FOR IDLE (LBS/ENG):

THRUST FOR REVERSAL (LBS/ENG):

NOISE CURVE DATA SHEET

HOW MANY?

NOISE CURVE IDENTIFICATION NUMBER:

NOISE CURVE TITLE:

NUMBER OF THRUST VALUES:

CORRECTED NET THRUST (LBS/ENG):

EPNL AT 200 FT (dB):	NEL AT 200 FT (dB):
EPNL AT 400 FT (dB):	NEL AT 400 FT (dB):
EPNL AT 600 FT (dB):	NEL AT 600 FT (dB):
EPNL AT 1000 FT (dB):	NEL AT 1000 FT (dB):
EPNL AT 2000 FT (dB):	NEL AT 2000 FT (dB):
EPNL AT 4000 FT (dB):	NEL AT 4000 FT (dB):
EPNL AT 6000 FT (dB):	NEL AT 6000 FT (dB):
EPNL AT 10000 FT (dB):	NEL AT 10000 FT (dB):

CORRECTED NET THRUST (LBS/ENG):

EPNL AT 200 FT (dB):	NEL AT 200 FT (dB):
EPNL AT 400 FT (dB):	NEL AT 400 FT (dB):
EPNL AT 600 FT (dB):	NEL AT 600 FT (dB):
EPNL AT 1000 FT (dB):	NEL AT 1000 FT (dB):
EPNL AT 2000 FT (dB):	NEL AT 2000 FT (dB):
EPNL AT 4000 FT (dB):	NEL AT 4000 FT (dB):
EPNL AT 6000 FT (dB):	NEL AT 6000 FT (dB):
EPNL AT 10000 FT (dB):	NEL AT 10000 FT (dB):

MODIFICATION DATA SHEET

RESTRICTION OVERRIDES

NOISE CURVE NUMBER

OVERRIDE TYPE

NOISE CURVE NUMBER

OVERRIDE TYPE

HOW MANY MODIFICATIONS?

RESTRICTION # TYPE:

GRADIENT:

START:

END:

AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:

RESTRICTION # TYPE:

GRADIENT:

START:

END:

AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:
AFFECTED TRACK:	AFFECTED TRACK:

GRID OUTPUT SPECIFICATION SHEET

AIRPORT DATA FILE NAME:

RUN-TIME FILE NAME:

TITLE FOR OUTPUT:

GRID SPECIFICATION:

ALTERNATIVE THRESHOLD VALUES? YES NO

NEW THRESHOLD VALUES (6)

1. 2.

3. 4.

5. 6.

STARTING X-COORDINATE:

STARTING Y-COORDINATE:

X-INCREMENT:

Y-INCREMENT:

NUMBER OF X-VALUES:

NUMBER OF Y-VALUES:

Do you wish to use the detailed printout options? yes no

Print the contribution of each noise curve set to the total noise at each point? yes no

Print detailed information for each flight at each point? yes no

CONTOUR SPECIFICATION ENTRY FORM

AIRPORT DATA FILE NAME:

RUN-TIME FILE NAME:

OUTPUT TITLE:

METRIC:

CONTOUR VALUE:

OPTIONAL VALUES

TOLERANCE:

STARTING X-COORDINATE:

STARTING Y-COORDINATE:

MAXIMUM STEP SIZE:

STOPPING X-COORDINATE:

STOPPING Y-COORDINATE:

MAXIMUM NUMBER OF CONTOUR POINTS:

CONTOUR PLOT DATA SHEET

WHICH FILE DO YOU WANT TO PLOT?

NAME THE PLOT CONTROL FILE:

TAPE LOGICAL UNIT NUMBER:

PLOT DEVICE LOGICAL UNIT NUMBER:

DO YOU WISH TO SPECIFY THE PLOT SIZE, SCALE, OR ANGLE?

PLOT HEIGHT (INCHES):

PLOT SCALE (FT?INCH):

ANGLE OF PLOT TO X-AXIS (DEGREES):